

American Aviation

Lear L-5 Autopilot CHOSEN FOR SLICK'S DC-6's

The Learpilot can also help you toward
more in-the-air hours per plane . . .

Whether you operate heavy aircraft of the DC-6, Constellation, Stratocruiser class or DC-4's, DC-3's, Convairs, Lodestars, DH Doves or Twin Bëeches, you should know the basic reasons why the Lear L-5 autopilot system, complete with automatic ILS approach coupler and automatic Altitude Controller, was chosen by Slick.

• INCREASED FLIGHT EFFICIENCY • LOW MAINTENANCE
• CUSTOM ENGINEERED INSTALLATIONS • OPERATIONAL
SIMPLICITY • COMPACT CONSTRUCTION • PLUS—LEAR'S
GREAT AUTOMATIC DISCONNECT SAFETY FEATURE

LEARNING
11916 WEST PICO BLVD. LOS ANGELES
Grand Rapids Division, Grand Rapids, Mich.
Lear Romec Division, Elyria, Ohio
Lear International Export Corporation
9 East 45th Street, New York 17, N. Y.



The Name Men Fly By®

Annual Accessory and Equipment Issue

Gas Turbine Thermocouples by



EX



AIRTRENDS

Report that General Dynamic Corp. was negotiating to buy Convair has been emphatically denied by both companies. GDC is parent company of Canadair Ltd.

•

Airlines hope that CAB staff members who think present profits may be too high will remember 1945, when Board forced fare cuts, reduced mail pay, and left industry without funds for re-equipment program. New jets must be financed.

•

Top names being discussed for presidency of Air Transport Association include Stuart G. Tipton, ATA general counsel; D. W. Nyrop, who has resigned as CAB chairman; John Floberg, Assistant Secretary of the Navy for Air; Ray Ireland, vice president of United Air Lines; Harold Jones, California attorney and former CAB member. A committee of airline executives named to select a president has held discussions but has not reached a decision.

•

Defense Production Administration has now approved 287 airline transports for rapid tax write-offs. This is almost halfway to the agency's interim goal of 600 planes by end of 1954. Latest approval was \$47,417,500 certificate permitting American Airlines to amortize the cost of 25 DC-7's in five instead of seven years for tax purposes. The 287 planes involve \$264.7 million.

•

Aircraft manufacturers' engineering departments are catching up on their work loads, and are returning to a 40-hour week.

•

Although the Douglas X-3 special research plane is believed to be a Mach 3 or better design, it is strictly subsonic in initial configuration. Two Westinghouse J-40 jets are used. Plane, nearest thing in the piloted aircraft category to a guided missile, made first flight Oct. 20.

•

Trend toward heavier civil planes was seen in first seven months of this year, when sales of aircraft weighing more than 3,000 lbs. rose to 2,008, a 19.2% gain over same period last year. Shipments of civil planes under 3,000 lbs. were up only 8%.

•

There have been exploratory discussions by State Dept., CAB and airlines on question of German route pattern and possible form of bilateral agreement with Western Germany after ratification of a peace treaty. No decisions have been reached.

•

Indication that airlines' "reconfirmation rule" is working is seen in American Airlines' report that the new system has reduced no-show passengers by 50%.

The Washington View

Material Controls: Going, Going . . .

The supply of controlled materials, steel, copper and aluminum, is becoming so plentiful as a result of government-sponsored expansion programs that the lifting of the Controlled Materials Plan seems a certainty by the end of the first quarter of 1953. As a matter of fact, CMP would probably have died sooner if it had not been for the steel strike.

But removal of the materials allocations program may bring with it occasional headaches for the components of the aircraft industry producing for civilian consumption, i.e., builders of transports and executive aircraft, lightplanes and their engines and propellers.

Those same companies, of course, will be protected in obtaining materials for the military planes they produce. When CMP folds, there will probably be a clause permitting the Aircraft Production Resources Agency at Patterson AFB to step in and order the mills to set aside certain quantities of materials if they cannot be obtained on the open market by military aircraft and engine producers.

If those companies producing civilian aircraft should encounter any difficulties in buying certain steel, copper or aluminum alloys, there will be no agency comparable to the present NPA Aircraft Division to battle for them. But transport builders will probably be able to get the military to intercede if necessary because of the fact that commercial carriers add to the nation's air lift potential.

Firms building lightplanes, however, will have almost no source to turn to if they should find themselves unable to obtain some materials. Actually, however, any shortages which do develop will probably be short-lived and no real difficulties are expected to be encountered by any aviation firms.

Politics and the CAB

Despite the decision by Donald W. Nyrop to step down as chairman of the Civil Aeronautics Board effective October 31, the Democrats will probably continue to constitute a majority on the CAB regardless of who wins the presidential election.

Nyrop's term was scheduled to expire December 31, 1953. His resignation means that Vice Chairman Oswald Ryan (a Republican) takes over the job November 1 and will probably hold it until the incoming President nominates a new chairman after inauguration day.

But President Truman is in the good position of waiting until after the election before deciding on the next step. If Stevenson is

elected, Mr. Truman probably will leave the CAB member post unfilled and let the Illinois governor decide who will get the job and who will be chairman.

If General Eisenhower is elected, however, President Truman has the legal power to make a recess appointment lasting through the end of the next session of the Senate, probably the fall of 1953. This recess appointee, who in all probability would be a Democrat, would not be subject to Senate confirmation when the 83rd Congress convenes January 3, according to Congressional legal experts.

Thus, if the General does become the President, he may well be faced with a situation whereby he can choose a Republican for the chairmanship of the CAB but cannot do anything about the Democratic majority. The Civil Aeronautics Act provides that no more than three of the five Board members may be selected from the same political party.

Strike Results

Futility of the recent strikes by the AFL-Machinists against Lockheed-Burbank and Douglas-El Segundo is evidenced by the agreement reached after two weeks of Washington mediation sessions. The IAM negotiators agreed to accept a five cent hourly pay boost from Douglas, which is exactly the amount the company had offered before the strike began.

Union leaders will probably point to some of the fringe benefits they were conceded as proof that the walkouts were useful but the fact remains that the IAM struck both plants unsuccessfully in an attempt to win higher pay than its rival union, the CIO-Autoworkers, garnered from North American Aviation just before the Lockheed strike began September 8.

It is all the more surprising because the Machinists have been far less prone to walk out of a plant to back up demands than the UAW in the past. In the fall of 1951, for example, the IAM voted to accept Douglas wage offers at El Segundo and Santa Monica while the UAW refused and struck the Long Beach plant. And after the Long Beach dispute was settled IAM spokesmen proudly pointed out to newsmen that they had ended up with more from Douglas by accepting Douglas' proffered wage hikes than the UAW did in turning them down, striking and getting the hikes only partially retroactive.

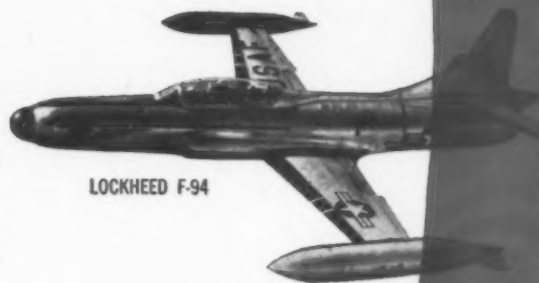
There seems to be little doubt that leaders of the Machinists locals at Douglas and Lockheed led the headquarters group in Washington astray by convincing them that the two companies would yield on demands for higher wages.

. . . Robert M. Loebelson

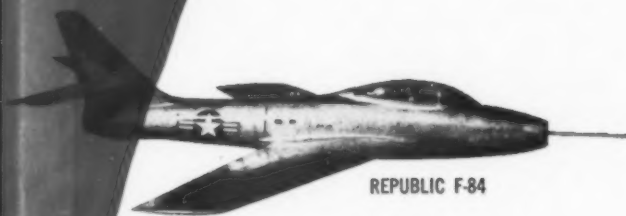
VISIBILITY by Swedlow



NORTH AMERICAN F-86



LOCKHEED F-94



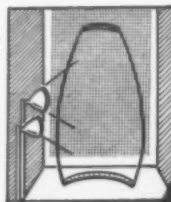
REPUBLIC F-84



BOEING B-47

Perfection in Optical Qualities

has made SWEDLOW transparent acrylic canopies virtually the standard of the aircraft industry. Fifteen years of specialization in the fabricating of transparent plastics, plus exacting inspection requirements, have gained for SWEDLOW the complete confidence of the aircraft industry. A few of the outstanding applications of SWEDLOW-made acrylics to aircraft are shown above. We shall be glad to assign staff engineers to work with you on your specific requirements in fabricated acrylics.



Swedlow
PLASTICS CO.

LOS ANGELES, CALIFORNIA • YOUNGSTOWN, OHIO

Engineering to the Nth power...



O'er the ramparts we watch as we track a guided missile aimed at an attacking enemy or his home base. Yes, missiles may fight tomorrow's battles or prevent them. And Convair, the *only* company developing and building *every* basic type of aircraft, has a guided missile team helping America achieve a weapons system for *every* conceivable mission. Watch for new ramparts of peace, built through engineering that aims at the maximum of power . . . the Nth Power!

CONVAIR

SAN DIEGO & POMONA, CALIFORNIA • FORT WORTH & DANGERFIELD, TEXAS

CONVAIR WILL SOON MANUFACTURE A TYPE OF MISSILE FOR THE U.S. NAVY BUREAU OF ORDNANCE IN POMONA, CALIFORNIA
... AMERICA'S FIRST PLANT FOR THE MASS PRODUCTION OF OPERATIONAL GUIDED MISSILES

TABLE OF CONTENTS

October 27, 1952
Vol. 16 No. 11

FEATURE	PAGE
Editorial	9
Details on the X-3	10
The Cost of Complexity ...	13
News Roundup ..	15
International Report	17
Approved Overhaul Times ...	18
Spark Plug Data	20
Production Spotlight	76
Engine Overhaul Facilities ..	82
Engine & Parts Production ...	103
CAB News	104
People	108
Classified	121
Advt. Index	122



Looking for More Information?

It's as simple as ...

- A: Use list below to find reference number of item.
B: Write reference number on appropriate postcard, below.
C: Mail.

• Accessories

- 62—Exhaust Syst.: Ryan
- 60—Flowmeter: Eclipse 9100
- 59—Fuel Pump: Romec RG-9080
- 61—Fuel Pump: Romec RD-7790
- 66—Oil Cooler: UAP-7800
- 63—Oil Tank: UAP-512120
- 69—Pump-Vac: Eclipse 33E02
- 71—Pumps AD1: Romec 8825
- 68—Segregator: UAP 5410-2
- 64—Starter: Eclipse 36E07
- 65—Starter: Eclipse 756
- 70—Starter: J&H JH6
- 67—Starter-Turbine: J&H D-31-1

• Actuators

- 107—Air door: Air Associates M-2790
- 109—Canopy: Air Associates EE171
- 108—Cowl Flap: Air Associates M-2975
- 106—Jato release: Air Associates EE 5410
- 111—Linear: Airborne Accessories 244M3
- 110—Rotary: Airborne Accessories R-412
- 116—Cowl flap: Lear 8056
- 118—Mag. brake: Airborne Accessories R42
- 119—Screw jack: Lear 564A
- 112—Actuator: Minn.-Hon. MG-7008
- 117—Servo: Schwien D7
- 115—Actuator: J&H D115
- 113—Actuator: J&H DZ-10
- 114—Actuator: Minn.-Hon. MG-7011
- 120—Wast gate motor: Minn.-Hon. MG-7012

• Airport Communications

- 249—VHF Station: Wilcox 428
- 252—Terminal Omni: Md. Electronic MDR
- 250—Control Tower: Lear LTR-6G
- 251—Direction Finder: FTL 14L

- 253—Transmitter: Wilcox 99A
- 254—Radio Telephone: Narco VG TR-1

• Air Conditioning

- 183—Controls: Barber Colman
- 181—Heaters: Surface Combustion
- 182—Refrigeration: Stratos NUR-15
- 184—Air Pump: Eclipse 1511
- 185—Supercharger: Stratos S-60-5
- 186—Blower: Dynamic M-8862
- 187—Blower: Dynamic M-4582
- 188—Refrigeration unit: Stratos BUR 50

• Airport Equipment

- 241—Air Conditioner: Thermo AF-75
- 245—Baggage Cart: Tobey
- 248—Fueling Nozzle: Parker
- 240—Heaters, Ground: Herman Nelson # 1
- 242—Heater, Ground: Herman Nelson BT-400
- 244—Loading Ramp: Tobey
- 236—Power Supply: MGC 672 ESAH
- 237—Power Supply: Inet 1497-A
- 238—Power Supply: Homelite 24A115
- 239—Power Supply: MGC 666
- 243—Tractor: Mercury A-452-52
- 247—Turntable: Wakefield B-1
- 246—Scale: Toledo 1500

• Analyzers

- 72—Bendix ign. 11-3350
- 75—Land-air eng.
- 73—Sperry Eng. D-5
- 74—Sperry Eng. D-6A

• Autopilots

- 52—Lear L-5
- 53—Minn.-Hon E-11
- 50—Pioneer PB-10A
- 51—Sperry A-12

• Beacons, etc.

- 36—VHF Navigation antenna
- 39—Isolation ampl.
- 40—Isolation ampl. jack box

- 38—Marker beacon recvr.: Bendix MN 53B
- 37—Marker beacon recvr.: Lear L-2200

• Cargo Handling

- 85—Cables, Tiedown: Peck & Hale A-4
- 83—Container, Shpg.: Tobey EF-197
- 81—Fittings, Tiedown: Adams-Rite
- 84—Fittings, Tiedown: Av. Dvel. 5049
- 82—Winch Holst: Lug-All 3000-HD

• Computers

- 42—Approach Horizon: Collins 329B-1
- 44—Course Indicator: Collins 331A-1
- 45—Radial Converter: Eclipse 7202
- 41—Steering Computer: Collins 562A-1
- 43—Zero Reader: Sperry
- 43—Zero Reader: Sperry Z-1 & Z-2

• Deicers

- 189—Distributor: Eclipse 1532
- 191—Regulator: Eclipse 1545
- 190—Timer: Eclipse 42E00

• Electrical

- 149—Inverter: Holtzer Cabot MG244
- 149—Limiter: Burndy FLL
- 150—Thermostat: Vap. Heat.
- 151—Battery: Willard AW-12-36
- 152—Battery: Exide 6-FH-13
- 153—Rheostat: Ohmite
- 154—Relay: Advance
- 155—Terminal: Burndy
- 156—Relay: Ward Leon. 103
- 157—Vacuum Warning: Eclipse 3124
- 158—Power Fail. Ind: Eclipse 36200

REPLY CARD FOR ALL OTHER COUNTRIES

PLACE
STAMP
HERE

AMERICAN AVIATION

1025 VERMONT AVENUE, N. W.

WASHINGTON 5, D. C.

U. S. A.

PRINTED
IN U.S.A.

REPLY CARD FOR U.S.A. AND POSSESSIONS

FIRST CLASS
Permit No. 2455-R
(Sec. 34.9, P. L. & R.)
Washington, D. C.

BUSINESS REPLY CARD

No Postage Stamp Necessary if Mailed in the United States

POSTAGE WILL BE PAID BY

AMERICAN AVIATION

1025 VERMONT AVENUE, N. W.

WASHINGTON 5, D. C.

- **Electrical Accessories**
79—Generator: Eclipse 30E02
76—Inverter: J&H F-46
78—Fuel pump: Romec RG-9540
77—Regulator: Eclipse 1539-8

- **Engine Instruments**
86—Bulbs, Temp.: Lewis
90—Gauge, Temp.: Edison 200
87—Gauge, Engine: Edison 195
92—Gauge, Temp.: Lewis 49B
89—Gauge, Temp.: Scott 2-716
91—Gauge, Oil Press: Scott RN-2550
88—Trans. Press: Eclipse 7600

- **Fire Detectors**
95—Detector: C-O-2 ASDT
93—Detector: Fenwal 17343
96—Detector, Smoke: Kidde
94—Detector, Fire: Kidde
97—Detector, CO: MSA DR-45878

- **Fuel Quantity Indicators**
105—Aviation Engineering Corp.
103—Minn.-Hon.
104—Simmond Aerocessories

- **Furnishings**
Buffet: Weber DC-6
225—Chair, Navigator: Hardman 604
226—Galley: REF DC-6B
227—Galley: REF DC-7
229—Oven: REF Whirlwind
220—Seat, Folding: Weber 72912
221—Seat, Folding: Aerosmith M-24
222—Seat, Folding: Hardman 300 5D
216—Seat, Passenger: TECO
217—Seat, Passenger: Aero-therm 443-3R
218—Seat, Passenger: Hardman 3026
219—Seat, HI-den: Burns IM-3
224—Seat, Pilot: Aerotherm 357
223—Seat, Pilot: Aircr. Mechanics

- **Hydraulics**
139—Accumulators: Parker
140—Accumulators: Vickers AA-14310
147—Motor: Vickers MF-3911
141—Pump: Denison AP 3V-11
142—Pump: Denison AP 3G-9
143—Pump: Vickers 909
145—Pump: Vickers PF A3Y-2
138—Regulators: Vickers AA-34500

- 144—Relief valves: Vickers AA-31300
146—Servopump: Vickers E-9536

- **ILS Equip.**
26—Antenna-Gl. Slope: Collins 37P-2
28—Crosspointer Ind: Weston 1D-48
27—Receiver G. S.: Av. Acc. R-89M
25—Receiver G. S.: Collins 51V-1
24—Receiver G. S.: Wilcox 429A

- **Instruments**
198—Accelerometer: Eclipse 3416
202—Airspeed: Eclipse 1426
197—Directional Gyro: Eclipse 16800
196—Gyrohorizon: Eclipse 14603
195—Gyrohorizon: Sperry H-5
199—Gyrosyn Compass: Sperry C-2A
201—Lift Control Ind.: Safe Flight
200—Mag. Compass: Eclipse 1841
194—Turn & Bank: Schwen B4B
193—Turn & Bank: Eclipse 3906
192—Vertical Gyro: Lear

- **LF & HF Communications**
23—Inverter: Eclipse 12142
21—Receiver: ARC RA-1B
22—Receiver: Narco LFR-1
19—Transceiver: Narco VTLR-1
18—Transmitter: RCA AVT-49
20—Trans-Rec'r: Collins 618S-1

- **Misc. Communications**
34—Aircraft Blower: Dynamic M4381 B-1B
31—DME Receivers: Narco DIC
28—DME Receivers: FTL-34A
30—Filters: Filtron Co.
33—Paging Amplifier: Bendix M1-36A
35—Radomes: BF Goodrich & Keller
32—Signal Generator: ARC H14

- **Navigation Equip**
3—Antenna: Collins 37J2
5—Receiver: ARC 18D
2—Receiver: Bendix MN85D
6—Receiver: Collins 51R-3
1—Receiver: Narco VTR-1
4—Receiver: Lear LR-560

- 16—Transmitter: ARO T-11B
15—Transmitter: Bendix TA-18BB
13—Transmitter: Collins 17M-1
12—Transceiver: Lear LVTR-36
14—Transceiver: Narco VHT-2
11—Trans-Rec'r: Wilcox 440A
17—VHF Transmitter: Lear RT-10E

- **Oxygen**
54—Kit: Scott 87 Aviox
57—Mask: Puritan 1138
80—Mask Smoke: Scott 6200FL
55—Regulator: FI Pwr. 1550
56—Regulator: Puritan 1070

- **Pneumatics**
100—Compressor: Cornelius 130RO-100
101—Compressor: Kidde 870589
99—Drive, Air Turbine: Stratos TP 15-2
102—Motor: Romec RD744OA
98—System, Pneumatic: Airesearch

- **Radio Compasses**
48—Receiver: Av. Acc. AA R5/ARN-7
49—Receiver: Bendix MN62A
47—Receiver: Lear ADF-14
46—Receiver: RCA AVR-42

- **Regulators**
230—Pressure: Aerotec RV9002
232—Pressure, Water: Romec RB-7550
235—Temperature: Aerotec RV21001
231—Vacuum: Schwen 2550
233—Vacuum: Romec RA-2090
234—Voltage: J&H GRZ8

- **Safety**
177—Flare: Kilgore K-37-F5
178—Flare: Kilgore SA-8
174—Flashlight: Bright Star 1624
179—First Aid Kit: Medical Supply Co. CAA#2
180—Jacket: Air Cruiser AD4
175—Raft: Goodyear ATA
176—Raft: Air Cruisers 2920
173—Signal, Distress: Aerial Prod. HP

- **Shop Equipment**
212—Booster pump: Cleveland W8346
207—Borescope: Testa B18
210—Compression tester: Gabb
215—Cylinder fixture: Fulmer
203—Engine stand: Cleveland AC 24

- 208—Engine stand: Whiting
200—Hydraulic: Aeroquip 10000A
204—Oxygen test: Fluid Power 3102
213—Tach. test: Strata 700
206—Temp. tester: Fenwal 8001-5
214—Spot check: Magnaflex
211—Wing Jack: Smith-Nelson 2560-31
205—Zyglo: Magnaflex ZA-28

- **Switches**
167—Afterburner press.: Aerotec P-1200
170—Float: Aerotec F6001
164—Fluid Pressure: Gen'l Controls AL-58D
162—Pressure: Gen'l Controls AL-58E
163—Pressure actuated: Meletron 417
166—Pressure actuated: Meletron 1516
165—Pressure: Romec RB-8361
160—Snap Action: Unimax X-101
169—Snap Action: Unimax KMKXN
171—Snap Switch: Micro A419
159—Ram air: Aerotec P-904
172—Rotary tap: Ohmite 608
161—Thermal: Fenwal 17320-4
168—Trim tab: Gen'l Control BS-58-000

- **Valves**
125—Check: Aerotec B2004
133—Check: Koehler K-1353-6
123—Check: Koehler K1332X4
126—Dump: Koehler 61F-368-1
127—Filler: Parker A-1
122—Fuel level control: Parker
129—Gate: General Controls AV-16B
121—Gate: Hydro-Aire
128—Magnetic: Gen'l Controls A1-58K
135—Pilot: Gen'l Controls AV-14G
131—Relief: Allen 4P10
132—Selector: Gen'l Controls AV-13A
137—Shut-off: Gen'l Controls AV-9
124—Shut-off: Parker 4115D
136—Shuttle: Aeroguld 790
130—Thermal Relief: Aeroguld 710-Z
134—Vent: Aerotec B-18002

- **VHF Omni-range**
10—Omni-bearing indic.
9—Omni-bearing selec.
7—Radio mag. indic.: Collins 332C-1
8—Radio mag. indic.: Eclipse 36105

TO THE EDITOR:

Please send me more information on the items with the following numbers _____

and on the following items in the tables and catalog listings _____

(Name)

(Position)

(Co. Address)

TO THE EDITOR:

Please send me more information on the items with the following numbers _____

and on the following items in the tables and catalog listings _____

(Name)

(Position)

(Co. Address)

Editor and Publisher

WAYNE W. PARRISH

Executive Editor Managing Editor

ERIC BRAMLEY W. D. PERREAULT

JAMES J. HAGGERTY, JR. Military Editor
JOSEPH S. MURPHY Technical Editor
WILLIAM V. HENZEY Transport Editor
ROBERT M. LOEBELSON .. Manufacturing Editor
PREBLE STAVEN Legislative Editor
HAL TUFTY Engineering Editor
ANTHONY VANDYK Internat'l Editor
LOIS C. PHILMUS Corporation Aircraft
WALTER A. KILRAIN .. Copy & Production Editor
WALLACE I. LONGSTRETH Rates and Tariffs
KEITH SAUNDERS News Analyst
RICHARD F. MCGRATH Special Assignments
DORIS ROWEZE Airline Statistics
FRED S. MUNTER West Coast Editor
R. G. WORCESTER Consultant
JEAN-MARIE RICKE Paris Editor
ROY PEARL London Editor
HERBERT SHAW Air Materiel Command

General Manager: Leonard Elserer
Director of Advertising: Stephen R. Kent
Circulation Promotion Mgr.: Larry Brettner

American Aviation is published every other Monday by American Aviation Publications Inc., Washington, D. C. Printed at the Telegraph Press, Harrisburg, Pa. Subscription rates for United States, Canada, Mexico, Central and South American countries—\$5.00 for 1 year; \$8.00 for 2 years; \$10.00 for 3 years. All other countries—\$7.00 for 1 year; \$12.00 for 2 years. Entered as Second-Class matter in Washington, D. C., and Harrisburg, Pa.

Change of Address: Send old address (exactly as it appears on mailing label of your copy of magazine) and new address, including zone number, if any, to 1025 Vermont N.W., Washington, D. C. Allow two weeks for change-over.

Publishing Corporation: American Aviation Publications, Inc., Wayne W. Parrish president; Leonard Elserer, vice-president and general manager; Albert H. Stackpole, Eric Bramley, vice presidents; E. J. Stackpole, Jr., secretary-treasurer.

American Aviation incorporates Airports and Air Carriers, Airports, Aviation Equipment, The American Pilot, Aviation Sales and Service, U. S. Aviation and American Airports. All rights to these names are reserved.

American Aviation Daily (including International Aviation): Published daily except Saturdays, Sundays and holidays. Subscriptions: \$18 one month; \$200 one year. Keith Saunders, managing editor.

American Aviation Directory: Published twice a year, spring and fall. Single copy, \$7.50. Marion E. Grambow, managing editor.

Official Airline Guide: Monthly publication of airline schedules and fares. Subscriptions: U. S. A. and countries belonging to the Pan American Postal Union, including Spain and the Philippines, \$11.00 one year, Canada, \$11.50. All other countries, \$12.50. Published from editorial offices at 139 North Clark St., Chicago 2, Ill. Central 6-5804. Robert Parrish, managing editor.

American Aviation Traffic News (Incorporating Air Tariff Reports): Published daily except Saturdays, Sundays and holidays. Subscriptions: \$150 a year. Wallace I. Longstreth, managing editor.

OCTOBER 27, 1952

Meet Your Editors



Loebelson

DO you read "The Washington View" page of AMERICAN AVIATION? (That's the one found on the buff-colored insert, page two, of every issue). Well, back of this specialized coverage of the industry . . . and the man who also writes those informative special reports and news stories of aviation manufacturing for us . . . is the genial Robert M. Loebelson . . . known to the staffers as Bob or "Lobo".

Bob's been our Manufacturing Editor since the early spring of 1951. His background, like that of other AMERICAN AVIATION editors, has certainly been varied and is one which has thoroughly prepared him for his position.

Bob joined the *Columbus Citizen* as a general assignments reporter while still studying at the Ohio State School of Journalism. He also added some writing experience with the Associated Press. After graduation, he went into the infantry. The Army assigned Bob to the Army Specialized Training Program, in which he was supposed to study French. Instead, Bob wound up studying Japanese and climbing phone poles in Camp Crowder, Missouri. Well, that's the Army. By that time the war had ended and Bob had some two years of Japanese behind him, but he never had gotten around to making use of the language! (When Japanese aviation starts growing, he suspects he'll have to brush up fast).

Back in civilian life, Bob served as general news reporter for the *Ohio State Journal*. From here, he joined the *Springfield News and Sun* and the *Dayton Herald*. One of his assignments included covering the death watch of the late and beloved Orville Wright.

In 1947 the opportunity to cover aviation came along. His boss, in true newspaper fashion, said: "Okay, Loebelson, you're our aviation writer." That was it. Bob liked the idea and found the spot a natural for himself. His beat included Wright Field, Dayton Airport, and the goings on in the major airlines stationed there. He was one of the first civilians to fly a jet. Bob says it was Lockheed's TF-80C, now known as the T-33 . . . and that 600 mph is plenty fast, thanks!

The next logical step was for Bob to join the huge Air Force base at Wright Patterson field. He was appointed News Editor of the AF's *Technical Data Digest* which covers all the important technological developments in aviation. The *Digest* is released to all the Air Force, Army, and Navy research installations and to contractors. Naturally, Bob's reading included many a copy of AMERICAN AVIATION, from which he culled quite a bit of valuable data to add to his *Digest* stories. He finally got to like and depend upon AMERICAN AVIATION, so much that he wrote about the possibilities of a job with us.

An opening developed some months later and he and wife, Jean, and daughter, Barbara, moved to Falls Church, Virginia.

In addition to aviation manufacturing, Bob covers labor developments and the happenings at the Government agencies connected with aircraft production in one way or another.

ADVERTISING OFFICES . . .

New York Office: Administration Building, LaGuardia Airport, New York, N. Y. Illinois 7-4100. Stephen R. Kent, director of advertising; A. B. Copeland, regional advertising manager; G. MacKenzie, sales promotion manager.

West Coast Office: Park Central Building, 412 West Sixth St., Los Angeles 14, Calif. Trinity 7997. Fred S. Hunter, manager.

Chicago Office: 139 North Clark St., Chicago 2, Ill. Central 6-5804. Bruce L. McGregor, regional advertising manager.

Foreign Advertising Representative: United Kingdom—Pearl, Cooper Ltd., 2-3 Norfolk St., Strand, London, W. C. 2. Tel. Temple Bar 8111/2.



Corsairs Join the French Navy

Glistening new Corsairs wearing the anchor and tri-color insignia of the French Navy are rolling off production lines at Chance Vought Aircraft in Dallas, Texas. They are F4U-7 Corsairs, now being built in quantity for the French Government under the Mutual Defense Assistance Program.

France is getting America's number one piston engined fighter-bomber in the F4U-7. It is similar to the F4U-4 Corsair, but, like the AU-1 Corsair currently in production for the U. S. Marine Corps, carries heavier armor and armament. Other Corsair models have flown thousands of vital missions in Korea.

Chance Vought Aircraft . DALLAS, TEXAS

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION
AMERICAN AVIATION

Editorial

Introducing With Pride

THIS ISSUE of AMERICAN AVIATION is the first of its kind in the world aviation press.

It is a reflection of our firm belief that progress in the aviation world as a whole is directly dependent upon the hundreds of companies producing the thousands of items of equipment which go to make up today's aircraft. The range of these items is

great—from those that are virtually standard on every airplane to items which are now purely experimental but which may become mandatory on the planes of tomorrow.

This is really the history of aviation equipment. An idea is born for a new device to provide better instrumentation, more positive control, added protection from ice, fire, or other hazards. Both private companies and government invest in the development of prototype models. Tests are conducted in the laboratory and in aircraft. Eventually a unit is accepted. A new device is born and proved, or it is

rejected, and as a result aircraft are made to perform better and operate more economically or more safely.

Some of the photos and descriptive data in this issue are for items that are quite new. Others have proved themselves by the rigid tests of everyday operation.

For the first time in any publication we present a complete breakdown of the approved overhaul times for all major items of equipment used by the scheduled airlines—broken down by specific airline, aircraft type, and specific equipment. This one chart took more than 20 man-days to compile. There is data on spark plugs and fabrics. And for the first time in any publication, we present a complete breakdown of the production status for all present day piston engines and spare parts. There are other charts and feature stories on engine overhaul and many subjects related to parts, accessories, and equipment.

We are proud to present this contribution to the unceasing endeavours of industry toward better more economical, and safer airplanes.

. . . WAYNE W. PARRISH

First Details of the X-3 . . . News of Delta Developments

THE ODD-LOOKING AIRPLANE at the right is a staff artist's conception of the latest in the series of special research aircraft—the Douglas X-3. No photograph of the airplane has yet been released, but enough information about the plane has leaked through the security wraps to assemble this rough idea of the general configuration.

Most noteworthy item is the radical new wing of small span, stubby and not swept back although the design was planned for very high speeds. The fuselage is also considerably longer than that of a modern jet fighter.

The X-3 is not intended to be a military airplane and it will never go into production. It is the latest member of the stable of special research planes with which the Air Force, Navy and the National Advisory Committee for Aeronautics are investigating flight characteristics in the subsonic, transonic and supersonic speed ranges with varying aircraft configurations and power plants. The other planes in the group are the Bell X-1, the original supersonic airplane, the Douglas D-558-II Skyrocket, which is currently the world's fastest airplane (1,238 miles per hour); the Northrop X-4, used for subsonic and transonic exploration; the Bell X-5, which is being used for an investigation of the practicability of changing the degree of wing sweepback during flight; and the Bell X-2, a stainless steel plane to be used for very high speed research. All have been flying except the X-2 and the X-3.

The X-3 made its first flight on Monday, October 20. It had been at Edwards Air Force Base, the USAF's flight test center in the Mojave Desert of California, for some time and had been put through a series of taxi tests.

The X-3 has been in development for well over five years. It started out as a design study directed toward the development of a plane capable of a top speed of Mach 3 (about 2,000 miles per hour at altitude) and an altitude ceiling of more than 200,000 feet. Douglas made more than 60 different design studies, ranging from a stubby, blunt-nosed model to long slender designs such as the one shown above. Ram-jet, rocket, pulse-jet and turbojet types of propulsive units, both singly and in combination, were studied as possible power plants.

It is understood that the Air Force has modified the original specifications downward, but from a de-



ARTIST'S version of the Douglas X-3.

sign standpoint it should still be an extremely fast airplane. However, in its original configuration the X-3 will not be the super-speed plane it was expected to be. Power is supplied by two Westinghouse J-40 jet engines, developing a total of about 17,000 pounds thrust. But this power is not great enough to drive the plane at the high speeds that were expected of it.

In its present configuration, with jet power, the X-3 will probably perform only in the Mach 1 speed area. Initial tests will not be speed runs; they will be made to check out the radical aerodynamic configuration, which represents the nearest thing in the piloted aircraft category to a guided missile. It is possible that, after the initial tests, the plane will be modified to take rocket power or some other type of propulsion to bring it nearer to its original design capabilities. This modification was made in the Douglas D-558-II, which was put through a series of transonic tests with jet power and later converted to rocket power for high speed runs.

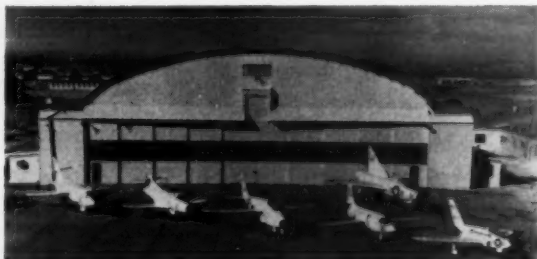
Pilot of the X-3 in its initial flight test program will be Douglas test pilot Bill Bridgeman, who flew the D-558-II to its 1,238 mile per hour record speed.

UNTIL A COUPLE OF YEARS AGO, the delta or triangular, wing type of airplane configuration was little more than a design idea, but it now appears to be the coming thing. Consolidated Vultee Aircraft Corp. pioneered the delta with its XF-92 Air Force experimental fighter and the British followed with the Avro Models 707A and 707B. Today there are five delta plane types in the U. S. and Britain which are actually in production.

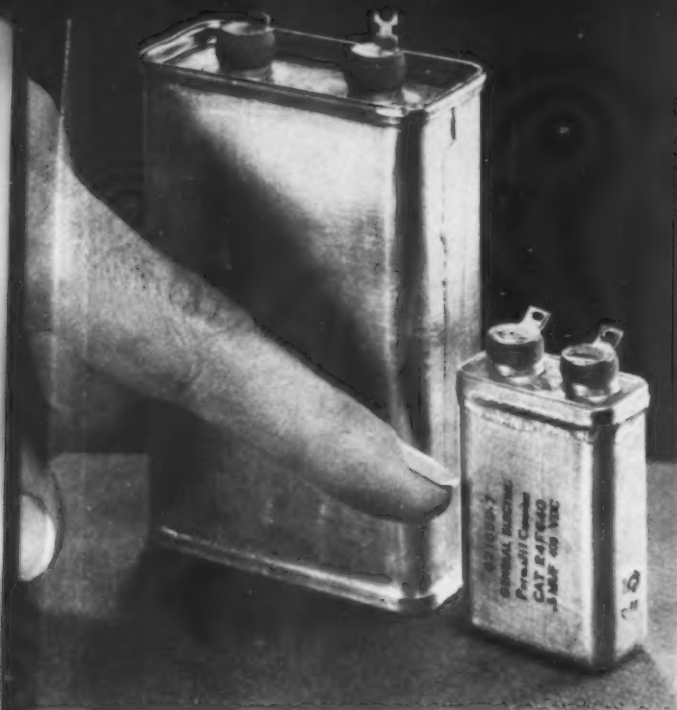
Convair is still leading the way with two of the five types: the F-102 Air Force all-weather interceptor and the F2Y Navy seaplane fighter, which is in only limited production but which shows promise of becoming an operational type. The other American plane is the Douglas F4D, also a Navy design. Britain has a fighter and a high speed bomber—the Gloster GA-5 Javelin and the Avro 698 four-jet bomber.

In addition, there is one more American delta design which may become a production airplane—the Republic F-103, an advanced interceptor for the Air Force. There is also a good possibility that the Air Force will turn to a delta design for the supersonic bomber which will eventually replace the Boeing B-52.

. . . JAMES J. HAGGERTY, JR.



RESEARCH aircraft lined up at Edwards AFB, Calif.



G.E.'s PERMAFIL D-C CAPACITORS operate for 10,000 hours or longer at full-rated voltage in ambients up to 257F. They are 1/5 the size of liquid-filled capacitors derated to operate at that temperature.



G.E. "FLYWEIGHT" SILICONE AUTOTRANSFORMER is 1/2 to 1/3 lighter, delivers 14 volt-amps per ounce compared to four volt-amps produced by a transformer of conventional materials.

G-E COMPONENTS REDUCE WEIGHT SAVE SPACE—UP TO 80%!



G.E.'s AIRBORNE TRANSFORMER-RECTIFIERS assure a light dependable source of d-c power with little maintenance. Used with an alternator, they cut weight by eliminating long bus runs and d-c generating equipment usually required. Available in 50 and 100-amp units.

For electrical equipment that saves space and weight, take a look at these G-E Aircraft Components. Up to 80% smaller, carefully built and tested, they can mean greater efficiency for your aircraft's electrical system.

Check the features of the G-E "Flyweight" Silicone Autotransformers—the most spectacular transformer design in years.

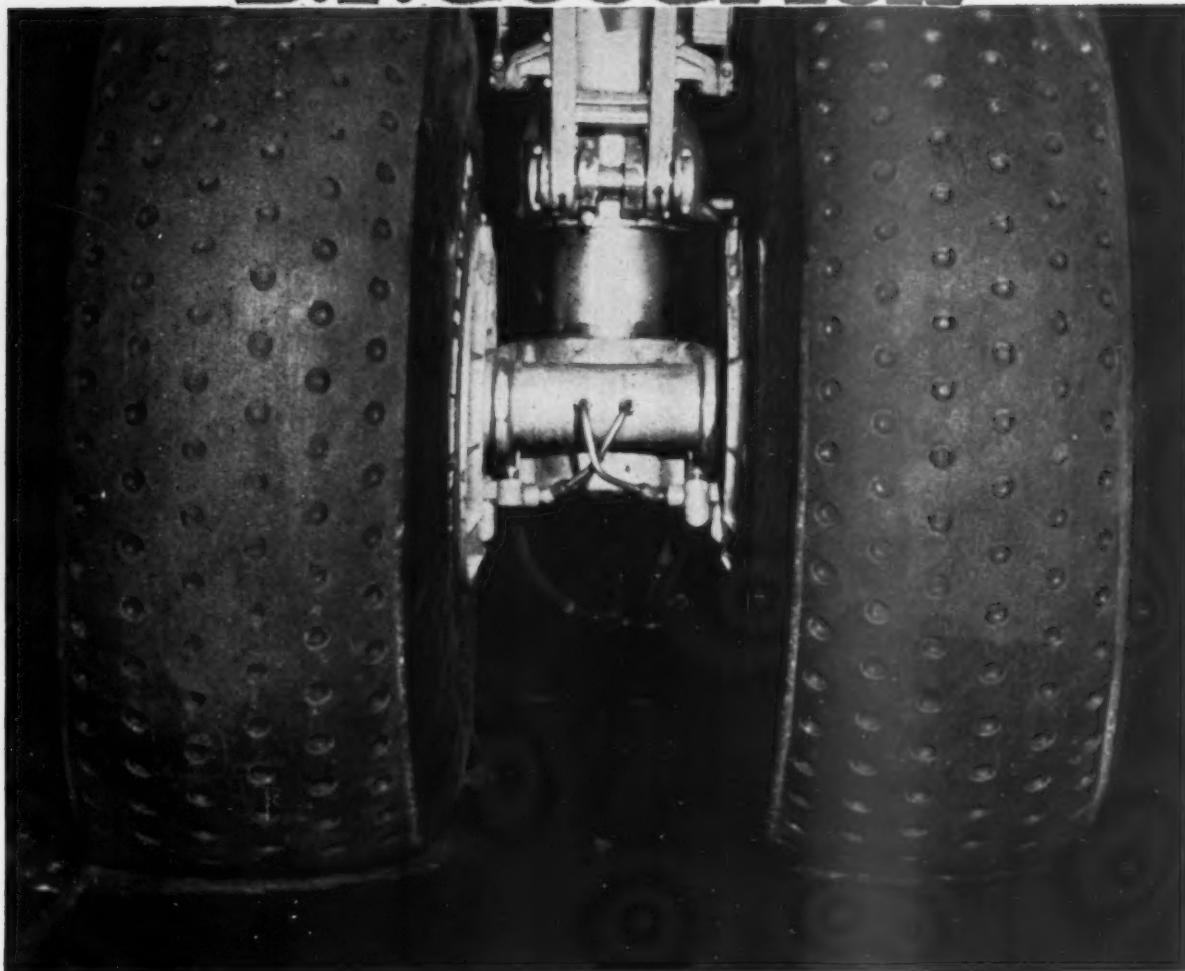
Note the tiny size of the Permafil d-c capacitor . . . every bit as dependable as larger liquid-filled units. And see what G.E.'s Airborne Transformer-Rectifiers can do towards eliminating heavy, unnecessary d-c generating equipment and long bus runs.

The next time you specify electrical components, call on your local G-E representative. He can recommend just the equipment you need for better aircraft performance. And for more information on the units shown on this page, write to *Section 210-38C, General Electric Company, Schenectady 5, N. Y.*

You can put your confidence in—

GENERAL  ELECTRIC

B.F. Goodrich



24 ~~20~~ airlines switch to new B. F. Goodrich dimpled tire

WE RECENTLY ANNOUNCED that twenty airlines had tested and switched to the new B. F. Goodrich dimpled tire. Now four other users report that they have adopted it as standard equipment.

One airline reported 20% more landings on DC-4's. A typical report from tests on a fleet of DC-3's: "We removed the tires after 400 hours, 1200 landings. In the process of recapping, we discovered that there was enough rubber left for about 100 hours more, a total of 1500 landings."

The new B. F. Goodrich dimpled tire

has a longer lasting cord construction which cuts down separation. It has a new tread with dimple-like indentations in the rubber. These dimples provide better distribution of the tire load and reduce exposure to tread cutting. Retreading is simpler. Carcass rejections are fewer.

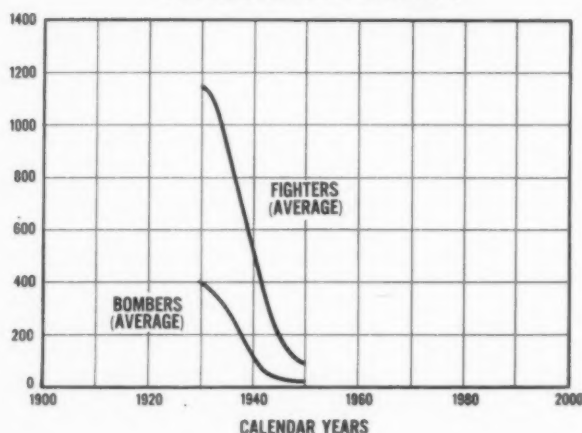
The airlines landing on BFG dimpled tires include: American, Braniff, Capital, Central, Continental, Empire, Frontier, Hawaiian, Lake Central, National, Northeast, Northwest, Pan-American, Philippine, Pioneer, Southern, Southwest, Trans-Texas, United and West Coast.

B. F. Goodrich is now producing the dimpled tire in seven airline sizes. The new, longer wearing dimpled tire is another example of BFG's leadership in rubber research and engineering. Other B. F. Goodrich products for aviation include wheels and brakes; heated rubber; De-Icers; Avtrim; Plastilock adhesives; Pressure Sealing Zippers; inflatable seals; fuel cells; Rivnuts; accessories. *The B. F. Goodrich Company, Aeronautical Div., Akron, Ohio.*

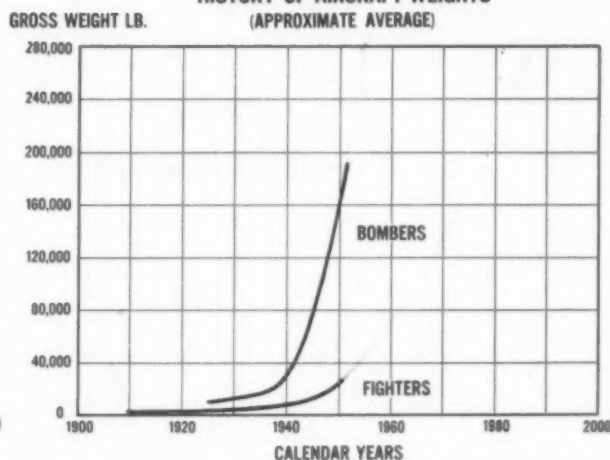
B.F. Goodrich
FIRST IN RUBBER

AMERICAN AVIATION

PURCHASING POWER OF \$100 MILLION
(CORRECTED FOR COST-OF-LIVING INDEX)



HISTORY OF AIRCRAFT WEIGHTS
(APPROXIMATE AVERAGE)



The High Cost of Complexity in Aircraft

That 110-pound antepilot adds 1,100 pounds and \$44,000 to the airplane, designer claims.

VIRTUALLY no field of science or production has failed to benefit from the exacting technological demands of the aviation industry. As aircraft have advanced from crude "string and bailing wire" craft to the supersonic vehicles of today, each advance has brought with it new and more complex equipment to enable the improvements in airframes, powerplants and related accessories.



Heinemann

Virtually without cost, the industries serving our everyday needs have adopted the improved and lighter metals, increased engine power, miniaturized electrical equipment, improved and more reliable communications, more efficient heating, and all the rest.

Earlier this month E. H. Heinemann, chief engineer with Douglas Aircraft Company's El Segundo Division, outlined the price which the public, the military services and the aviation indus-

try are paying for these developments. In a talk before the Washington Section of The Institute of the Aeronautical Sciences, Heinemann summed up the cost:

- **\$100 million**, which in 1930 would buy 1,100 military fighter planes, by 1950 would buy less than 100.

- **\$100 million**, which in 1930 would buy approximately 400 bombers, will now buy less than 20.

- **Availability** of airplanes in combat is suffering, availability being inversely proportional to the amount of equipment they carry.

Speed Only Double

It might be said, Heinemann noted, that this is the cost of improved performance and greater safety, but in reality the speed of fighter aircraft has only doubled during the period when the gross weight of military aircraft increased from 10 to 20 times.

Heinemann documented the case which has long been a subject of argument between design engineers and operational groups, whether military or civil. This is the factual cost of a pound

weight to the builder and buyer of aircraft. Using conservative figures Heinemann showed this to be \$400 per pound in the initial cost of the aircraft, providing the performance of the aircraft was not to be impaired.

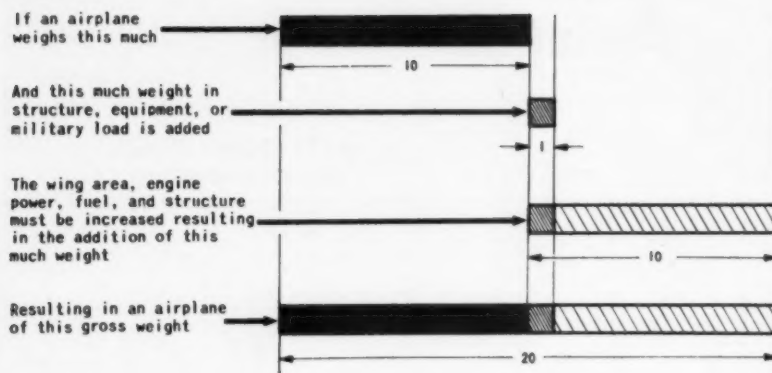
Introducing what he termed the "growth factor," he traced the developments which follow the decision to add a basic piece of equipment to an airplane. Assume that the unit weighs 110 pounds, as does an automatic pilot in a typical fighter. The combat pilot deserves the best plane the engineer can design, consequently, there is no thought of permitting this valuable aid to cut down the plane's performance. It must be absorbed without loss of performance.

To accommodate this demand the engineer must add wing area, engine power, fuel for this additional power, heavier structure to accommodate these changes, etc. Factual studies show that an average growth factor is 10. For each pound added in equipment nine more pounds must be added to cancel out performance penalties.

This means the 110 pound autopilot, multiplied by the growth factor of 10, adds 1,100 pounds to the plane's gross weight. Figured at \$40 per pound of gross weight, this means the new unit costs \$44,000 per plane.

GROWTH FACTOR

For example:



to be 15 or 20 in the case of high performance jet fighters.

The \$40 per pound cost, which includes experimental and production costs, is several years old and Heinemann suspects this is more likely to be \$50 per pound of gross weight at this time.

No one would argue that the designer should not incorporate new safety features into his aircraft, nor any device which improves the pilot's chance to meet the enemy and survive. The question arises as to the final contribution of any device and whether its use has been weighed against the actual cost, as shown here, or just simply against the deceiving first weight and cost penalty.

Among the examples Heinemann cited were:

- A mechanical stall warning de-

vice, weighing four pounds, adding 40 pounds to the gross weight and \$1,600 to the plane cost;

- Jettisonable seats weighing 100 pounds, effectively adding 1,000 pounds gross weight at a cost of \$40,000;

- An automatic inverter changer, weighing seven pounds, adding 70 pounds to the gross weight and \$2,800 to the cost of the plane;

- Barrier crash provisions weighing 250 pounds, having 2,500 pounds effect on the gross weight of the plane and costing \$100,000;

- Wing deicing, adding 300 pounds, 3,000 pounds effect on gross weight, and costing \$120,000;

Nine such typical additions added 8,480 pounds to the gross weight and \$339,200 to the plane cost.

Realizing these facts, it is easier to

appreciate the seriousness of the system complexities added since the end of World War II. The hydraulic system of the Douglas SBD weighed 150 pounds as contrasted with 500 pounds for the present AD-4 type planes. The electrical system of the SBD weighed 175 pounds contrasted with 500 pounds for the electrical system, including radar, of the AD series: armament of the SBD ran 115 pounds while that of the AD series is 600 pounds.

"A sure way to keep airplanes on the ground," Heinemann argues, "is to let them grow excessively in size. It is up to us to control this situation, rather than let it control us."

Skyraider Cut a Ton

Heinemann is sure it can be done. In the case of the Douglas Skyraider, for instance, Douglas cut nearly 2,000 pounds off the specified contract weight without sacrificing performance or safety. By the same token, while the 100 pound jettisonable seat may be necessary, two high performance airplanes have been designed with equally effective escape chutes at little increase in weight and cost. Heinemann's recommendations on cutting weights and costs:

- Educate all personnel having to do with aircraft, design, requirements, and procurement of the seriousness of the problem, with special emphasis on growth factor and cost.

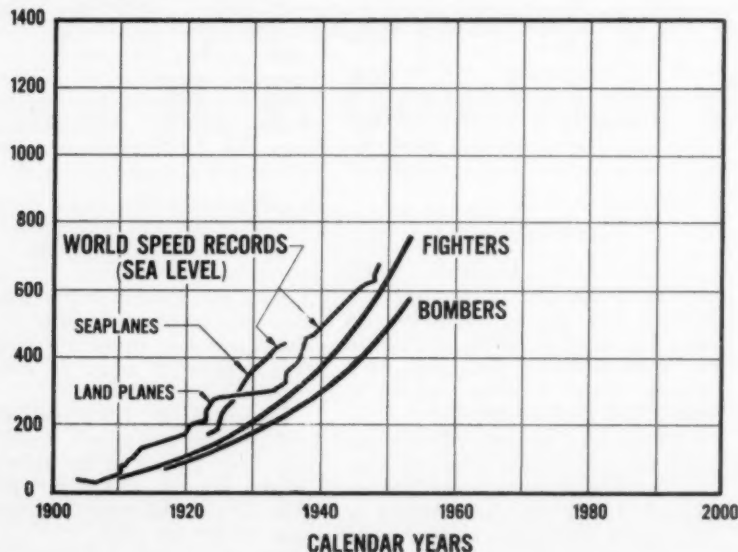
- Review and re-evaluate specific requirements to determine their actual military worth and necessity.

- Review the design features and equipment during the preliminary stages of each new model from the point of view of what is best for the airplane as a whole, rather than upon equipment or detailed requirements as they may have been established in the past.

- Reduce complexity and weight by applying ingenuity to solving problems by avoiding them.

HISTORY OF AIRPLANE SPEEDS

TRUE AIRSPEED MPH



Scope

THIS ISSUE was compiled from questionnaires sent to some 1,200 aircraft and parts manufacturers and to all the nation's airlines. It is a selective list of the products of these companies, not an all inclusive list, since such a compilation would not be possible within the covers of any publication. Representative products of all those manufacturers answering the survey are included in individual items or group listings.

News Roundup

PEOPLE

Ralph S. Damon, president of Trans World Airlines, has been presented with the **Bronze Medal of Honor** of Athens, Greece, "in recognition of his exceptional feelings and his noble efforts towards the City of Athens." The mayor of Athens made the presentation at a dinner in that city.

Col. Fred J. Ascani received the **Mackay Trophy** from **Gen. Hoyt S. Vandenberg**, USAF Chief of Staff, for setting a world speed record for a 100-kilometer closed course at National Air Races in Detroit last year. The record was 635.6 mph in a combat-equipped North American F-86E Sabre, topping the previous 605.8 mph mark set by the late **John Derry** in a de Havilland 108.

Henry W. Thomas has been appointed executive assistant to **Ramsay D. Potts, Jr.**, president of **Independent Military Air Transport Association**. Thomas was chief of the Air Force's passenger branch, air transport division, responsible for overseas charter service performed for the military by commercial carriers.

TECHNICAL

CAA, in a 31-page analysis, said *True* magazine's article "The Secret Gamble That Can Kill You" contained "flagrantly irresponsible statements" and "unsubstantiated charges of neglect of duty." **Ben Stern**, CAA director of aviation information, stated that investigation showed that many of the alleged incidents of plane accidents resulting from inadvertent reversing of propellers never occurred, and that other incidents cited in the article, written by **Donald Keyhoe**, were in no way related to reversing propellers. CAA study showed that reversing prop's rate of failure has been only 0.00097 per 1,000 engine flight-hours in scheduled operation—much lower than other comparable equipment.

Adm. DeWitt C. Ramsey, president of **Aircraft Industries Association**, urged CAA to accept foreign airworthiness standards in granting certificates to foreign jet transports, provided the same privileges are accorded U. S. designs. He added that AIA strongly opposes any fixing of airworthiness rules for jet transports, either domestically or internationally, in advance of a reasonable period of design, development, and operational experience.

Pan American World Airways plans a \$500,000 mechanized **engine overhaul shop** at San Francisco International Airport, in a new building scheduled for completion next May. The shop, which will maintain a \$425,000 parts inventory, will perform major overhauls for PAA's entire Pacific-Alaska Division fleet.

LABOR

Douglas Aircraft Co. employees at the Ontario, Calif., maintenance and overhaul base have voted against being unionized. In an NLRB election, 224 workers voted 124 for no union, 82 for United Auto Workers-CIO, 18 for International Association of Machinists-AFL.

Pan American World Airways and **Air Line Pilots Association** negotiations over a new contract will probably end up before a Presidential fact-finding board. PAA pilots are voting to approve a strike notice.

MILITARY

Air Materiel Command plans to spend \$59 million next year on construction projects at nine AMC bases. Largest expenditure, \$26,586,000, will be at Kelly AFB, Tex., a maintenance base.

Douglas A3D prototype is ready for first flight at Edwards AFB, where it has been undergoing taxi tests. **George Jensen**, Douglas test pilot, is to take the twin-jet bomber, designed for Navy attack operations off large carriers, on its initial flight. A3D was ordered into production by both services before the prototype was completed or flown. Air Force version is RB-66.

Air Force, which nearly a year ago proposed increase in monthly rental of C-46's from \$300 to \$1,875, never put the higher rate into effect, it has been learned. When the proposed rate came up for approval, **E. V. Huggins**, Assistant Secretary of the Air Force, reduced the figure to \$1,500, this fee being considered equitable. There are now 101 AF C-46's leased to about 33 scheduled and non-scheduled carriers. Largest is Slick Airways, which has 16.

Gen. Lemuel C. Shepherd, Jr., Marine Corps Commandant, charged that Air Force efforts in Korea to destroy Communist supplies far behind the front lines have been a "fizzle." AF has been hurting the enemy, but "not hurting enough," he said.

What is believed to be the longest overwater air-to-air refueling flight made by single-engine jet aircraft was completed by 47 **Republic F-84G's**. They flew 2,575 miles non-stop between Midway Island and Japan, being refueled by Boeing B-29 tankers. Trip started in Texas, with stops in California and Honolulu. Refueling was also used on California-Hawaii leg.

Air Force's Air Research and Development Command has established a European Research Office, with headquarters in Brussels, Belgium. Office will contract for research in Western Europe and monitor AF work already under way in Europe.

Grounding restriction on **Northrop F-89** twin-jet all-weather fighter has been extended by Air Force to include all F-89's. Initial order grounded all models except those on alert duty with Air Defense Command.

Superiority margin of **North American F-86 Sabre** jet fighter over the Russian-designed MiG-15 in Korean combat has increased. Ratio for past three months has been 15 to 1, with 106 MiG's lost against seven F-86's. Prior to that time, ratio was 9 to 1.

EQUIPMENT

W. Hudson Fysh, chairman and managing director of **Qantas Empire Airways**, Australia, said the airline will need replacement aircraft in 1956-57 and that British jets will probably be ordered. On an equipment-hunting world tour, Fysh said in London that the Bristol Britannia's long range seemed to make it most suitable for QEA routes, but that before decisions were made more information was needed on success of the Proteus 3 turboprop.

Dr. Albert Plesman, president of KLM Royal Dutch Airlines, says his company will have one or two **atom-powered transports** by 1967. Each plane will cost over \$26 million but will earn \$16 million a year, he adds.

Pan American World Airways has ordered five more Douglas DC-6B's.

Hamilton Standard Division of United Aircraft Corp. has been awarded a contract to supply air cycle refrigeration units for the Douglas F4D Navy jet fighter, bringing to eight the number of AF and Navy planes using Ham-Stan refrigeration and air conditioning units.

California Eastern Airways has

bought Cruzeiro do Sul's two DC-4's under a lease purchase agreement handled through Frandun Corp. of New York. They will be added to Cal Eastern's five transports now flying the Pacific airlift under MATS contract. Cruzeiro is using money from the sale as a down payment on the four Convair 340's it is buying.

Vickers-Armstrong Ltd., England, is doing production planning for the **Viscount 800**, stretched-fuselage version of the 700. The 800 series will be designed for bigger loads over shorter stages. First plane should be off the line in early 1955.

National Airlines has taken delivery of the first of eight 66-passenger DC-6B's. Remainder are to be received during next few months.

Southwest Airways bought four Martin 2-0-2's from Northwest Airlines and Transocean Air Lines. Planes were being used by **Japan Air Lines** under the management contract with NWA which expired Oct. 24. SWA has received some attractive offers for the planes, but it is likely that they will be placed in service on some of the company's local service routes. Two of the planes were owned by NWA, two by TAL. SWA has received two and expects the other two shortly.

Lockheed Aircraft Corp. has given design and performance data on its jetliner to **Capt. E. V. Rickenbacker**, president and general manager of Eastern Air Lines. Only details known are that plane will have sharply swept-back wing, carry over 100 passengers, and cruise at speed approaching 600 mph between 30,000 and 40,000 feet.

GOVERNMENT

U. S. Supreme Court upheld CAB decisions in **Alaska Service Case** and **Reopened Mississippi Valley Service Case**, denying petitions of Air Transport Associates in the former and Continental Southern Lines in the latter. Alaska case involved U. S.-Alaska certificates issued by CAB to Alaska Airlines and Pacific Northern Airlines. Mississippi Valley case involved local service awards to Ozark Air Lines and Southern Airways.

National Airlines applied for CAB certificate to operate between Miami/Tampa and Mexico City non-stop and also via Havana. NAL now flies Florida-Havana, and new route involves 1,100-mile Havana-Mexico City extension.

"Unreasonable and frivolous" were terms used by CAB air operations bureau's lawyers, **Allen C. Lande** and **Robert C. Lester**, in describing National Airlines' motion for a public explanation by CAB officials of the "delay" in

establishing final mail rates for NAL. The airline had claimed that the delay may ultimately cost it millions of dollars. **Lande** and **Lester** asked CAB to deny the request.

Frontier Air Lines asked CAB to extend its routes from Billings to Bismarck-Mandan via the important Williston Oil Basin. It wants Billings-Miles City - Glendive - Sidney-Williston-Minot-Dickenson-Bismarck-Mandan, and Bismarck-Minot-Dickenson-Williston - Wolf Point-Glasgow-Havre-Great Falls.

CAB has dropped its **Chicago-Washington route investigation**, first announced in 1949. Purpose was to see if uneconomic competitive service should be eliminated and various interchanges authorized. Improved traffic and favorable financial position of carriers makes investigation unnecessary, CAB said.

CAA Administrator Charles Horne called for a cooperative advertising campaign by the aviation industry "to revive in our young men and women the attraction which flying seems to have lost for them." He said only a small part of industry advertising budgets would be adequate for a campaign, and added that he is working on a plan which he will present to the industry shortly. His assistants in each region would be assigned solely to such a campaign "because their purpose in life is the promotion of aviation . . ."

MANUFACTURING

Piasecki's XH-16 40-passenger, tandem rotor, twin-engine helicopter won't fly until early 1953 because of late modifications. First model, carrying crew of four, will be powered by two P&W R-2180's of 1650 hp each. Second model, XH-16A, will have two unspecified Allison gas turbines.

The Glenn L. Martin Co. and Boeing Airplane Co. have received new AF orders. Martin got a second production order for the B-57 night intruder bomber, AF version of British English Electric Canberra. Boeing's was for continued production of B-47 Stratojet. Boeing has now built more than 300 B-47's.

FINANCIAL

American Airlines' nine months' net profit after taxes was \$9,762,000 against adjusted net of \$9,460,000 for the same 1951 period. Provision for taxes was \$10 million against \$15.4 million a year ago. Third-quarter net was \$4,663,000 compared with \$3,680,000 in 1951 period. Dividends of 25c and 87½c on the common and cumulative convertible preferred shares, respectively, were declared.

The Garrett Corp. reported net income of \$2,669,000 on all-time high sales of \$73,696,520 for the fiscal year ended June 30, compared with \$1,873,099 net on \$33,056,585 sales in the last fiscal year. Backlog, 90% military, is \$143 million against \$124 million a year ago. **AIRsearch subsidiaries** at Los Angeles and Phoenix accounted for most of the sales volume.

Pacific Airmotive Corp. had \$677,000 net profit on \$20,888,784 sales for nine months ended August 31, against \$558,085 net on \$16,569,907 sales in same 1951 period. Backlog was up 35% to \$17,939,961. About 50% of sales were commercial.

Stanley Aviation Corp. reported \$45,929 net income after taxes for fiscal year ended June 30, against \$4,124 net in previous year.

Beech Aircraft Corp. increased its quarterly dividend from 20c to 25c a share and declared an extra 20c dividend, both payable to stockholders of record November 17. This boosts payments out of earnings for fiscal year ended September 30 to \$1.05 a share, against 80c last year.

TRAFFIC

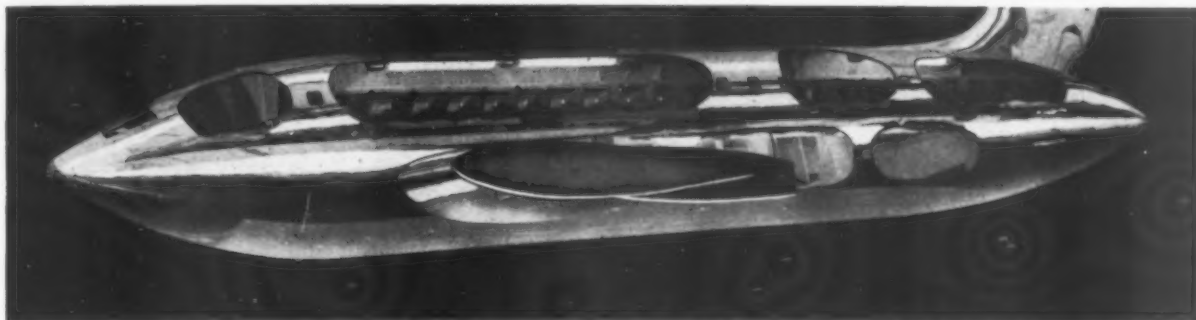
Scheduled domestic airlines flew more than one billion passenger-miles of coach service in the first six months of 1952, **Air Transport Association** said. The 1,017,082,000 total was 69.6% over the 599,696,000 performed in the same 1951 period. At present, 34 major U. S. cities and one in Canada are receiving scheduled coach service via 10 trunk airlines and one local service line.

An 18% gain in available seat-miles against an 18% increase in revenue passenger-miles resulted in a drop of 5.5% in the domestic trunk airlines July passenger load factor (from 69.95 in July, 1951, to 66.09 this year). Other traffic increases, however, brought total revenue plane-miles up 13%.

The "Reconfirmation rule" put into effect by the airlines on July 1 has reduced American Airlines' no-show passengers by 50%, the company says. Before July 1, AA's no-shows amounted to 16% of total number of passengers, compared to 8% on October 1.

United Air Lines flew 241,507,000 revenue passenger-miles in September, up 30% over the same 1951 months and only 3% below UAL's all-time record set last August. Mail totaled 1,657,000 ton-miles, up 2%; express, 843,000 ton-miles, up 14%; freight, 2,502,000 ton-miles, up 38%.

International Report



Handley Page Jetliner model shows that although the Handley Page HP 97 jet transport has a double-bubble fuselage strikingly like that of the Boeing Stratocruiser, the plane's configuration differs considerably from any previous transport aircraft. Prototype of the 96/150-passenger jetliner is scheduled to fly in 1954 with production starting two or three years later. Wing configuration is a matter of conjecture, particularly in view of Handley Page's current preoccupation with the crescent wing. The object of the crescent design is to take advantage of the best features of three

different types of wing which have been built for sonic-speed flying—the delta, the swept-back wing, and the razor-thin straight wing. Near the fuselage the crescent wing has similar characteristics to the delta; it is swept back about 60°, and it is broad and deep enough to house engines, fuel, undercarriage, etc. Farther across the span, the wing has the less radical sweep of a normal swept-back wing, and is not so deep in relation to its width. Finally, nearer still to tip, the wing becomes thin and almost straight—probably less than 15° of sweep.

Comet II Deliveries Due by 1953

The de Havilland Aircraft Company has no intention of curtailing the production program for the 44-passenger Comet II in order to speed deliveries of the 58-78 passenger Series 3, now scheduled to become available starting in 1956. (See p. 124.)

Deliveries of Comet II's to BOAC will start in the second half of 1953. The British manufacturer has in readiness plans for rapid expansion of production if needed and points out that "When an operator spoke of 50 Comet II's in 1955, de Havilland undertook to supply that quantity in addition to orders already taken, provided a contract was placed without delay" and "... offered to commence delivery of the Comet III late in 1956 and to supply at a rate rising to six a month in about two years."

The Series III will gross about 145,000 pounds and will cruise at "at least" 500 mph. The four engines will be civil versions of a military Rolls-Royce Avon de-rated to give 9,000 pounds of thrust. Practical stage length (taking into account reserves) will be about 60% greater than that of the Series I and the specific cost of operation will be "appreciably lower." The first Comet III should fly in 1954 and the production aircraft "should begin to appear" late in 1956.

Meanwhile deliveries of BOAC's fleet of nine Series I's were completed in late September and no more of this version will be built. All outstanding orders for the Series I will be met with IA's (offering improved performance—notably in gross weight—due to the use of Ghost engines with water injection). Deliveries of IA's to Canadian Pacific Airlines, Union Aéro-maritime de Transport, the Royal Canadian Air Force and Air France will proceed "during the ensuing months."

Only 21 of the Series I and IA (including two development aircraft) are being built. Larger sales, de Havilland states, were not to be expected because it was known that improved versions were likely to be available at a relatively early date, also because airlines were fairly well stocked with new fleets after the war, and because operators needed to be convinced of the merits of jet propulsion. The manufacturer quotes BOAC as having "plainly stated that the Series I has proved itself a profitable liner."

In its explanation of the present status of the Comet, de Havilland makes an allusion to its defense efforts by pointing out that its output of aircraft in 1952, in net tons, would represent more than 100 Comets. The company emphasizes that the rate of production

of Comets has been in pace with the attitude of the operators, "actually considerably in excess of orders in hand," and stresses, in addition to the commercial risk, the danger of "locking up productive facilities" and thereby versions.

Canadair Sets Pace In Varied Production

First of over 500 Lockheed T-33A jet trainers scheduled to be built under license by Canadair Ltd. is due to fly about November 1. Production will build up to about 40 aircraft a month by March 1.

The Montreal company is currently preparing to manufacture 200 Beech T-36 twin-engine trainers with the first aircraft slated to fly next summer. Production of the North American F-86 is now moving up to 50 planes a month; Canadair is building 1,000 of the fighters under license.

In the experimental shops the CL-21 high-wing "DC-3 replacement" is in the mock-up stage, whereas at the planning level Canadair is actively working on the project to build a reconnaissance version of the Bristol Britannia for the Royal Canadian Air Force. If the Montreal company gets the green light for production, a transport version would also be built for both commercial and military customers.

How Much Waste in Overhaul Scheduling?

Inconsistencies revealed by survey point up trends, highlight weak points in carriers' overhaul programs.

THERE are a good many thousand dollars that could be saved by taking a closer look at the various airlines' experience in the overhaul of aircraft and engine accessories, communications equipment, and flight instruments.

It seems apparent from the wide range of overhaul periods for the same unit, used on the same aircraft and under comparable operating conditions, that this is not being done to the logical extent. One reason for this is that it is a difficult task to arrange the available data in a useable form. The overhaul requirements of individual airlines are often studied and the general topic is widely discussed, yet wide-scale comparison is rare.

To simplify such comparisons and highlight some of the more prominent discrepancies, AMERICAN AVIATION has compiled a chart (see adjoining pages) showing 100-odd items of aircraft equipment with the overhaul times authorized by CAA for 67 combinations of airlines and equipment.

Engines Over 1,500 Hours

Engine overhaul times, the chart shows, have at last exceeded the 1,500-hour mark, the period which proved an effective barrier for some two years. Engine overhaul periods have progressed at somewhat regular intervals for all aircraft engines up to the 1,500-hour level, which no one appeared capable of, or interested in, exceeding.

The question was even debated as to the wisdom of going higher. Wasn't it true that replacement parts costs multiplied rapidly beyond this point? Engine parts which might go two overhaul periods at slightly lower times often would not pass inspection for a second run as first run time reached these high values, it was argued.

Now Chicago & Southern Air Lines is operating Wright R-3350-BD engines for 1,600 hours and Trans World Airlines is operating a sample group of engines to obtain approval on this period for their Lockheed Constellation engines. These lines should provide adequate experience to answer many of these questions.

Low overhaul times do not necessarily indicate an unrealistic approach to the engine or accessory overhaul problem. Some operators find the ability to correlate engine and accessory overhaul times, or to permit some otherwise mar-

ginal unit to run two engine overhaul periods, worth the added cost.

Significant in the chart figures is the fact that only four operators are running engines less than 1,000 hours between overhaul; three of these are DC-3 operators. Sixty-two engine/aircraft/airline combinations are operating engines 1,000 hours or more and seven are operating engines 1,500 hours. Of those operating engines 1,500 hours, there are five using Pratt & Whitney R-2000 engines and two with Wright R-3350 engines.

Three Engine Runs

Engine overhaul periods are significant not only because basic engine overhaul cost is so high but because so many accessories are automatically removed for overhaul as part of the powerplant installation or at engine overhaul time for convenience. Yet here too another trend is significant. Several airlines are starting to let propellers go three engine runs before overhaul, magnetos and generators two engine runs and even starters are, in two instances, going two engine overhaul periods.

CAA forms ACA 512 A, B, C, and D are the standard forms used by the airlines to list approved overhaul periods for engines, aircraft, instruments, and radio components. In making the accompanying compilations, it became apparent that the reporting forms are the beginning and end of the standardization. This is in part due to the major swing to approving "on condition" overhaul instead of requiring the operator to fix a specified period for each unit.

Uniform Exposure

But take a look at prop feathering pumps and motors. These are relatively uniform items of equipment which should be exposed to about the same amount of operation. Yet overhaul times for these units include airlines overhauling them at 1,000, 2,000, 3,000, 4,000, 5,000 hours, three at 7,000 hours, and one as high as 8,000 hours.

The only apparent difference in use of these pumps, which are basically part of the engines emergency equipment, would be in the amount of testing during engine run-up.

Another major discrepancy in the listings is the nature of the individual units. There is little question that individual operators experience trouble

with units which other operators find trouble-free. This accounts for many airlines listing units on these forms which others ignore. But listings do have some relationship to the nature of the unit and the effect which an inoperative unit would have on the plane's continued safe operation.

In this light it is interesting to note that, with the exception of the engines and engine accessories, one or more airlines have left out virtually every item on the list of aircraft accessories. If precedent were to be used in justifying the elimination of a particular component from the Form 512 listing, Form 512B (covering aircraft accessories) and much of 512C (instruments) could be eliminated.

This is no more strange than the importance attached to specific units. Items such as landing lights are often ignored completely; there is one instance of the hydraulic pressure regulator being "on condition;" brake control valves are sometimes ignored or set at extremely high airframe overhaul periods, etc. These contrast sharply with items like the navigation flasher light mechanism. The later units, relatively less critical, are reported almost without exception by the airlines. Overhaul times range from one to nine thousand hours for flasher mechanisms but most of them are at 4,000 hours or less.

Communications on Condition

Take altimeters. Virtually all the airlines use Kollsman altimeters, yet the approved overhaul times on this particular instrument range from 1,000 hours to 11,200 hours, the chart shows. Despite this strange range for one unit, there remains the fact that 19 of the airline/equipment combinations show altimeter overhaul at 6,200 hours. This appears to bear little resemblance to common overhaul periods for other units.

In the communications field we find 20 airlines reporting overhaul times as a given number of days, 14 using months instead of days, and one operator listing most radio equipment "on condition." The latter airline is apparently leading the parade in the matter of putting this type of equipment "on condition." This is not out of order since "on condition" may mean that overhaul times are very low; indeed it puts the operator in the position of being able to alter actual overhaul times immediately to meet any sudden rash of trouble while leaving trouble-free equipment alone.

e
e
(
,
,
e
y
s
o
r

e
s
g
-
n
-
e
-
f
n
d
of
es
h
ce

N

Airline Equipment	AAA	AAL				BAL	BNF		
	DC-3	DC-4	DC-6	DC-6B	240	DC-3	DC-3	DC-4	DC-6
COMPONENT									
Engines	1,000	1,400	1,400	1,000	1,100	1,000	1,100	1,200	1,100
Propeller	2,000	2,800	3,000	3,000	1,100	2,000	2,200	2,400	2,200
Carburetor	2,000	1,400	1,400	1,000	2,200	1,000	2,200	1,200	2,200
Magneto	1,000	1,400	1,400	1,000	1,000	1,000	1,100	1,200	1,100
Generator	1,000	1,400	1,400	1,000	1,100	1,000	1,100	1,200	1,100
Tach. Generator .....	.....	2,800	3,500	3,500	3,500	1,000	1,100	1,200	1,100
Starter	1,000	1,400	1,400	1,000	1,100	1,000	1,100	1,200	2,200
Fuel Pump	1,000	1,400	1,400	1,000	2,200	1,000	1,100	1,200	1,100
Vacuum Pump	1,000	1,400	1,400	1,000	1,100	1,000	1,100	1,200	1,100
Hydraulic Pump	1,000	1,400	2,800	2,000	2,200	1,000	1,100	1,200	1,100
Prop. Governor	1,000	1,400	3,000	3,000	1,100	1,000	1,100	1,200	1,100
Feathering Pump	2,000	4,200	.....	.....	.....	4,000	7,000	4,500	.....
Induction Vibrator	2,000	.....	OC	OC	OC	.....	.....	.....	.....
Fuel Flow Trans. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....
FUEL SYSTEM									
Booster Pumps	2,800	.....	4,500	4,500	4,400	5,000	9,000	4,500	5,000
Heater Fuel Pumps .....	.....	.....	.....	.....	.....	.....	.....	.....	4,000
OIL SYSTEM									
Oil Tanks	9,000	.....	.....	.....	.....	9,000	9,000	.....	.....
Oil Coolers	1,000	1,400	1,400	1,000	1,100	1,000	2,200	.....	.....
Temp. Regulators	1,000	1,400	1,400	1,000	1,100	2,000	2,200	.....	.....
HYDRAULIC SYSTEMS									
Gear Retract Struts	9,000	5,200	OC	OC	OC	9,000	.....	.....	9,000
Brake Control Valve	9,000	7,000	OC	OC	OC	9,000	9,000	.....	.....
Hydraulic Panel	9,000	7,000	.....	.....	.....	9,000	9,000	4,500	5,000
Hyd. Pressure Reg.	9,000	4,200	OC	OC	OC	9,000	9,000	2,250	.....
Reservoir Filter .....	.....	5,400	OC	OC	OC	.....	9,000	4,500	5,000
System Accumulators	9,000	7,000	OC	OC	OC	9,000	9,000	4,500	5,000
Windshield Wiper Motors ..	9,000	.....	.....	.....	.....	9,000	.....	9,000	.....
Rudder Boost System .....	.....	.....	.....	.....	.....	9,000	.....	9,000	.....
Wing Flap Control Valve ..	9,000	7,000	OC	OC	OC	9,000	9,000	4,500	5,000
Wing Flap Actuators .....	.....	7,000	OC	OC	OC	.....	9,000	4,500	5,000
Hyd. Hand Pump	9,000	.....	.....	.....	.....	9,000	9,000	9,000	9,000
Aux. Elec. Pump .....	.....	.....	OC	OC	OC	.....	9,000	9,000	5,000
DEICER SYSTEM									
Dist. Valve & Motor	A	5,400	.....	.....	.....	A	.....	4,500	.....
Oil Separator .....	.....	5,400	.....	.....	.....	.....	.....	4,500	.....
Combustion Heaters .....	.....	.....	.....	.....	.....	.....	1,200	.....	.....
Alcohol Pumps	A	5,400	.....	.....	.....	A	.....	4,500	.....
AIR CONDITIONING SYSTEM									
Combustion Heaters	1,000	.....	.....	.....	.....	.....	.....	1,300	2,500
Control Motors .....	.....	.....	.....	.....	.....	.....	.....	.....	5,000
Blowers .....	.....	.....	.....	.....	.....	.....	.....	2,250	5,000
Expansion Turbines .....	.....	.....	.....	.....	.....	.....	.....	.....	3,000
OXYGEN SYSTEM									
Regulators System .....	.....	.....	.....	.....	.....	.....	9,000	.....	.....
ELECTRICAL SYSTEM									
Voltage Regulators	1,000	1,400	OC	OC	OC	2,000	1,200	2,250	1,300
Rev. Current Relays	1,400	2,800	OC	OC	OC	2,000	.....	2,250	2,500
Flasher Units	3,000	5,400	6,000	6,000	4,400	5,000	2,250	2,250	5,000
Inverters .....	.....	1,400	1,500	1,500	4,400	.....	.....	4,500	1,300
Landing Lights .....	.....	.....	.....	.....	.....	.....	.....	2,250	1,300
Relays-Starter, Etc.	1,400	.....	.....	.....	.....	.....	.....	.....	5,000
PRESSURIZATION SYSTEM									
Cabin Super Charger .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cabin Press. Regulators ..	.....	.....	3,500	3,500	.....	.....	.....	.....	5,000
FLIGHT INSTRUMENTS									
Altimeter	3,000	5,000	5,000	5,000	6,000	4,000	1,300	6,200	5,000
Magnetic Compass	3,000	5,000	6,000	6,000	5,000	4,000	1,300	5,000	5,000
Air Speed Indicator	2,100	5,000	5,000	5,000	5,000	4,000	1,500	6,200	5,000
Turn & Bank	1,600	3,500	3,500	3,500	3,500	2,000	1,300	2,250	5,000
Rate of Climb	2,100	5,000	5,000	5,000	5,000	4,000	1,300	6,200	5,000
Direction Gyro	1,050	2,600	3,500	3,500	2,600	1,000	.....	2,250	2,500
Artificial Horizon	1,600	2,600	3,500	3,500	3,500	1,000	.....	2,250	2,500
Bank & Climb-AP .....	.....	2,600	.....	.....	.....	.....	900	2,250	.....
Dir. Gyro-AP .....	.....	2,600	.....	.....	.....	.....	900	2,250	.....
Remote Compass .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
AIRCRAFT & ENGINE INSTRUMENTS									
Manifold Pressure	3,000	5,000	5,000	5,000	5,000	4,000	1,100	4,500	5,000
Fuel Pressure	2,800	5,000	5,000	5,000	5,000	4,000	.....	4,500	5,000
Oil Pressure	2,800	5,000	5,000	5,000	5,000	4,000	.....	4,500	5,000
Vacuum Pressure	3,000	5,000	5,000	5,000	5,000	4,000	1,300	4,500	5,000
Hydraulic Pressure	9,000	5,000	5,000	5,000	5,000	4,000	7,000	4,500	5,000
Deicer Pressure	9,000	5,000	.....	.....	.....	4,000	7,000	4,500	.....
Oxygen Pressure .....	.....	5,000	6,000	6,000	5,000	9,000	A	.....	.....
Air Brake Pressure .....	.....	5,000	.....	.....	.....	.....	.....	.....	.....
Oil Temperature	4,000	5,000	5,000	5,000	5,000	4,000	1,100	5,000	5,000
OAT Indicator	4,000	5,000	5,000	5,000	5,000	4,000	1,300	5,000	5,000
Carb. Air Temp. ....	.....	5,000	5,000	5,000	5,000	4,000	1,100	5,000	5,000
Cyl. Head Temp. ....	.....	5,000	5,000	5,000	5,000	4,000	1,100	5,000	5,000
Fuel Quantity	2,400	5,000	5,000	5,000	5,000	4,000	1,100	4,500	4,000
Oil Quantity .....	.....	5,000	5,000	5,000	5,000	.....	.....	4,500	4,000
Tach. Indicator	2,100	5,000	5,000	5,000	5,000	4,000	1,100	4,500	5,000
Synchroscope .....	.....	.....	.....	.....	.....	.....	1,300	.....	.....
Fuel Quantity Trans.	9,000	2,000	.....	.....	.....	.....	.....	4,500	9,000
Fuel Pressure Trans.	2,800	2,000	.....	.....	.....	.....	1,100	4,500	4,000
Oil Pressure Trans.	2,800	2,000	.....	.....	.....	.....	1,100	4,500	4,000
Flap Pos. Trans. ....	.....	.....	5,000	5,000	.....	.....	.....	4,500	5,000
Ammeter	4,000	.....	5,000	5,000	5,000	.....	.....	.....	5,000
Voltammeter .....	.....	5,000	5,000	5,000	.....	.....	.....	5,000	.....
Flap Pos. Indicator .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bmpc Indicator .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
COMMUNICATIONS									
Dynamotor	12 M	120 D	120 D	120 D	120 D	.....	60 D	.....	.....
HF Comm. Unit	120 M	120 D	120 D	120 D	120 D	90 D	90 D	90 D	90 D
VHF Comm. Unit	6 M	120 D	120 D	120 D	120 D	75 D	.....	60 D	60 D
Marker Receiver	8 M	120 D	120 D	120 D	120 D	75 D	60 D	90 D	90 D
ADF Indicator	8 M	2,800	2,800	2,800	2,200	2,000	.....	.....	90 D
ADF Loop	10 M	2,000	2,000	2,000	2,000	4,000	120 D	120 D	.....
Microphones	OC	2,000	2,000	2,000	2,000	90 D	120 D	120 D	120 D
Headphones	OC	2,000	2,000	2,000	2,000	90 D	120 D	120 D	120 D
Glide Slope Receiver	6 M	90 D	90 D	90 D	90 D	.....	60 D	60 D	90 D
VHF Nav. Receiver	8 M	2,800	2,800	2,800	2,200	.....	120 D	120 D	120 D
ILS Indicator	8 M	120 D	120 D	120 D	120 D	75 D	.....	90 D	.....
ADF Receiver	8 M	.....	.....	.....	.....	.....	60 D	60 D	.....
Localizer Receiver	6 M	.....	.....	.....	.....	.....	.....	.....	.....
Omni Selector	6 M	2,800	2,800	2,800	2,200	.....	.....	.....	120 D

OVER

DC

1.2
3.6
1.2
1.2
1.2
1.2
1.2
1.2
1.2
1.2
4.0
...

3.6
1.2
1.2

9.6
9.6
9.6
9.6
9.6
9.6
9.6

9.6

9.6

9.6

9.6

9.6

6
6
2
6
1
1

5
5
5
5
5
5

5
5
5
5
5
5

5
5
5
5
5
5

5
5
5
5
5
5

5
5
5
5
5
5

5
5
5
5
5
5

5
5
5
5
5
5

5
5
5
5
5
5

5
5
5
5
5
5

5
5
5
5
5
5

IMPROVED AIRCRAFT, ENGINE, ACCESSORY AND RADIO COSTS

Compiled from official records by American Aviation, October, 1952

CAP			CEN	C&S		CAI		CAL		DAL	
DC-3	DC-4	749 049		DC-3	649	DC-3	DC-4	DC-3	240	DC-3	DC-4
1,200	1,300	1,000	1,000	1,350	1,600	1,225	1,300	1,250	1,200	1,250	1,250
3,600	3,900	1,000	2,300	2,700	1,600	3,675	3,900	2,500	1,200	2,500	2,500
1,200	1,300	1,000	2,000	2,700	1,600	1,225	2,600	2,500	2,400	1,250	1,250
1,200	1,300	1,000	1,000	1,350	1,600	1,225	1,300	1,250	1,200	1,250	1,250
1,200	1,300	1,000	1,000	1,350	1,600	1,225	2,600	1,250	1,200	1,250	1,250
1,200	2,600	1,000	1,000	2,700	1,600	1,225	2,600	1,250	1,200	1,250	1,250
1,200	1,300	1,000	1,000	2,700	1,600	1,225	1,300	1,250	1,200	1,250	1,250
1,200	1,300	1,000	1,000	1,350	1,600	1,225	1,300	1,250	1,200	1,250	1,250
1,200	1,300	1,000	1,000	2,700	1,600	1,225	1,300	1,250	1,200	1,250	1,250
1,200	1,300	1,000	1,000	1,350	1,600	1,225	1,300	1,250	1,200	1,250	1,250
1,200	1,300	1,000	1,000	2,700	1,600	1,225	2,600	1,250	1,200	1,250	1,250
4,000	4,600	1,000	7,000	1,350	.....	.....	5,200	.....	.....	.....	5,000
.....	.....	.....	1,000	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	2,000	.....	.....	1,300	.....	3,600	.....	.....
.....	4,800	2,400	.....	10,000	2,000	.....	4,500	2,500	4,800	.....	2,500
.....	.....	2,400	.....	OC	.....	.....	.....	.....	.....	.....	1,250
3,600	10,000	10,000	8,000	4,050	.....	11,000	.....	3,750	.....	.....	.....
1,200	1,300	1,000	1,000	.....	.....	1,225	2,600	.....	.....	.....	.....
1,200	1,300	1,000	1,000	.....	.....	1,225	.....	.....	.....	.....	.....
9,000	10,000	4,000	7,000	10,000	8,000	6,000	6,000	6,000	.....	.....	.....
9,000	4,800	.....	7,000	10,000	.....	.....	6,000	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	11,000	.....	6,000	.....	10,000	5,000
9,000	2,400	.....	7,000	10,000	.....	11,000	4,500	.....	.....	.....	2,500
.....	4,800	.....	.....	.....	.....	.....	4,500	.....	.....	.....	2,500
9,000	4,800	8,000	7,000	10,000	8,000	7,000	OC	6,000	.....	.....	5,000
9,000	10,000	4,000	.....	.....	4,000	.....	.....	.....	.....	.....	.....
.....	.....	8,000	.....	.....	8,000	.....	.....	.....	.....	.....	.....
9,000	4,800	.....	7,000	10,000	.....	.....	6,000	.....	.....	.....	5,000
9,000	10,000	.....	7,000	.....	.....	6,500	.....	10,000	.....	.....	5,000
9,000	10,000	4,000	7,000	.....	8,000	.....	.....	10,000	.....	.....	5,000
.....	.....	5,000	.....	.....	.....	.....	.....	.....	.....	.....	5,000
.....	4,800	A	OC	10,000	8,000	6,000	4,500	.....	.....	10,000	5,000
.....	4,800	A	OC	10,000	.....	.....	4,500	.....	.....	.....	5,000
.....
9,000	4,800	5,000	.....	.....	4,000	6,000	4,500	.....	.....	.....	5,000
.....
.....	1,200	1,000	.....	.....	1,000	2,000	2,000	.....	.....	1,250	2,500
.....
.....	4,800	.....	.....	.....	4,000	.....	4,500	.....	.....	.....	5,000
.....
.....	OC	.....	.....	5,375	9,000	11,000	.....	OC	.....	.....	.....
.....	1,200	1,200	1,000	1,350	1,600	2,000	.....	.....	.....	2,500	2,250
.....	2,000	.....	1,000	2,500	1,600	4,000	4,000	.....	.....	.....	2,500
1,000	3,600	.....	2,250	2,500	5,000	4,500	4,500	2,000	4,800	5,000	5,000
.....	3,600	.....	.....	.....	1,500	.....	4,500	.....	2,400	.....	2,500
.....	1,200	.....	.....	.....	.....	.....	2,000	.....	.....	.....	1,250
.....	2,000	.....	1,000	.....	.....	5,000	4,500	.....	.....	.....	5,000
.....	.....	1,200	.....	.....	1,025	.....	.....	.....	.....	.....	.....
.....	.....	OC	.....	.....	4,000	.....	.....	.....	.....	.....	.....
6,200	6,200	6,200	1,300	1,560	7,000	6,200	6,200	2,625	.....	5,000	5,000
6,000	6,000	6,000	1,300	5,375	7,000	6,500	6,500	2,625	.....	5,000	5,000
6,200	6,200	6,200	1,500	1,975	7,000	6,200	6,200	2,625	.....	5,000	5,000
2,000	2,000	2,400	900	1,250	3,750	2,750	2,750	1,625	.....	1,250	2,500
6,200	6,200	6,200	1,300	1,975	7,000	6,200	6,200	2,625	.....	5,000	5,000
1,000	1,200	1,000	900	1,000	1,600	1,600	1,600	1,625	.....	1,100	1,250
1,000	1,200	1,200	900	1,000	2,810	1,875	1,875	1,625	.....	.....	1,250
.....	.....	2,000	.....	.....	.....	.....	.....	.....	.....	900	2,500
.....	.....	1,000	.....	.....	.....	.....	3,000	.....	.....	.....	.....
5,000	6,000	5,000	1,100	2,730	5,500	5,500	.....	4,000	.....	5,000	5,000
5,000	6,000	3,000	1,100	5,375	6,000	5,500	4,000	4,000	.....	5,000	5,000
5,000	6,000	3,000	1,100	5,375	6,000	6,500	4,000	4,000	.....	5,000	5,000
5,000	6,000	5,000	1,300	2,730	6,500	6,000	6,000	4,000	.....	5,000	5,000
5,000	6,000	5,000	7,000	5,375	5,000	8,000	5,500	4,000	.....	5,000	5,000
5,000	6,000	5,000	7,000	OC	OC	7,500	.....	4,000	.....	5,000	5,000
.....	10,000	5,000	.....	.....	9,000	OC	.....	4,000	.....	5,000	5,000
.....	.....	5,000	.....	.....	9,000	.....	.....	.....	.....	.....	10,000
5,000	6,000	5,000	1,100	5,375	6,500	6,500	6,500	4,000	.....	5,000	5,000
5,000	6,000	5,000	1,300	5,375	6,500	6,500	6,500	4,000	.....	5,000	5,000
5,000	6,200	5,000	1,100	5,375	6,500	6,500	6,500	4,000	.....	5,000	5,000
5,000	6,000	5,000	1,100	5,375	6,500	6,500	6,500	4,000	.....	5,000	5,000
.....	6,200	5,000	1,100	1,560	7,000	6,500	6,500	4,000	.....	5,000	5,000
.....	.....	5,000	.....	.....	7,000	.....	6,500	.....	.....	.....	5,000
4,500	6,000	5,000	1,100	5,375	6,000	5,500	5,500	4,000	.....	5,000	.....
5,000	6,000	5,000	.....	5,375	6,000	.....	.....	.....	.....	5,000	.....
9,000	OC	3,000	.....	7,000	6,000	.....	8,000	.....	.....	5,000	5,000
.....	3,600	3,000	.....	.....	2,500	.....	.....	.....	3,600	5,000	5,000
.....	4,800	3,600	.....	.....	2,000	.....	.....	.....	3,600	5,000	5,000
.....	.....	.....	.....	.....	3,750	.....	.....	.....	.....	.....	.....
5,000	6,000	5,000	.....	2,730	7,000	5,000	5,000	.....	.....	.....	5,000
6,000	6,000	5,000	.....	2,730	7,000	5,000	5,000	.....	.....	5,000	5,000
.....	3,600	5,000	.....	.....	6,000	.....	4,000	.....	.....	.....	.....
.....	.....	3,600	.....	.....	5,000	.....	.....	.....	.....	.....	.....
.....	.....	.....	90 D	.....	.....	5 M	5 M	.....	.....	.....	.....
.....	.....	1,000	90 D	1,600	.....	5 M	5 M	.....	.....	2,500	2,500
.....	.....	.....	90 D	.....	.....	5 M	5 M	1,200	1,200	1,250	1,250
.....	1,000	1,000	90 D	6 M	6 M	5 M	5 M	1,200	1,200	2,500	2,500
.....	2,400	2,400	180 D	.....	3,000	.....	.....	1,200	OC	.....	2,500
2,000	OC	OC	90 D	8 M	OC	6 M	6 M	2,000	2,000	2,500	2,500
OC	OC	OC	90 D	OC	OC	6 M	6 M	2,000	2,000	OC	OC
1,000	1,000	1,000	90 D	1,000	1,000	5 M	5 M	1,200	1,200	1,250	1,250
1,000	1,000	1,000	90 D	1,000	1,000	5 M	5 M	1,200	1,200	OC	OC
1,000	2,000	2,400	.....	9 M	9 M	.....	.....	.....	.....	2,500	2,500
1,000	.....	.....	90 D	1,600	1,200	5 M	5 M	.....	.....	2,500	2,500
1,000	1,000	1,000	90 D	.....	.....	5 M	5 M	.....	.....	2,500	.....
.....	2,000	2,400	OC	1,600	1,000	.....	.....	.....	.....	2,500	.....

OVERHAUL TIMES

	EAL					EML	FAL	LCA	MCA (BNF)		NAL	
DC-6	DC-3	DC-4	749	1,049	404	DC-3	DC-3	DC-3	DC-3	240	DC-4	DC-6
1,250	1,400	1,000	1,425	1,000	1,200	1,050	1,000	800	1,150	1,000	1,500	1,300
1,250	2,800	2,800	2,850	1,000	1,200	2,100	1,800	1,800	2,300	2,000	3,000	1,300
1,250	1,400	1,000	1,425	1,000	1,200	2,100	2,000	1,800	1,150	1,000	1,500	1,300
1,250	1,400	1,000	1,425	1,000	1,200	1,050	1,000	800	1,150	1,000	1,500	1,300
1,250	1,400	1,000	1,425	1,000	1,200	1,050	1,000	800	1,150	1,000	800	1,100
1,250	1,400	2,000	1,425	1,000	1,200	1,050	1,000	800	1,150	1,000	1,500	1,200
1,250	1,400	1,000	1,425	1,000	1,200	1,050	1,000	800	1,150	1,000	1,500	1,300
1,250	1,400	1,000	1,425	1,000	1,200	1,050	1,000	800	1,150	1,000	1,500	1,300
1,250	1,400	1,000	1,425	1,000	1,200	1,050	1,000	800	1,150	1,000	1,500	1,300
1,250	1,400	1,000	1,425	1,000	1,200	1,050	2,000	800	1,150	1,000	1,500	1,300
1,250	1,400	1,000	1,425	1,000	1,200	2,100	3,000	800	1,150	1,000	1,500	1,300
.....	1,400	5,700	2,850	2,000	2,400	4,250	4,000	3,000	6,000	.....	4,000	.....
.....	.....	.....	.....	.....	1,200	.....	.....	800	.....	.....	.....	.....
.....	.....	.....	.....	2,000	2,400	.....	.....	.....	.....	.....	.....	.....
.....	.....	5,700	3,350	3,100	.....	4,750	4,000	.....	6,000	4,000	3,000	3,000
.....	.....	.....	1,810	1,500	.....	.....	.....	.....	.....	.....	.....	3,000
.....	1,400	.....	.....	.....	3,800	8,000	OC	.....	.....	.....	.....	.....
.....	1,400	.....	.....	.....	1,200	1,050	.....	800	.....	.....	.....	.....
.....	1,400	.....	.....	.....	1,200	1,050	.....	800	.....	.....	.....	.....
.....	12,000	11,000	12,000	OC	.....	4,750	5,000	8,000	12,000	.....	.....	.....
.....	.....	6,000	.....	.....	10,000	8,000	8,000	8,000	12,000	.....	5,000	.....
5,000	12,000	6,000	.....	.....	.....	8,000	8,000	8,000	12,000	.....	.....	.....
.....	.....	7,000	12,000	.....	5,450	8,000	8,000	8,000	.....	.....	4,000	5,000
5,000	12,000	5,700	12,000	11,000	10,000	8,000	8,000	8,000	12,000	.....	5,000	.....
.....	.....	11,000	6,300	3,100	5,450	8,000	8,000	8,000	12,000	.....	3,000	6,000
.....	.....	.....	12,000	11,000	.....	.....	.....	.....	12,000	.....	.....	.....
5,000	12,000	6,000	.....	.....	.....	OC	.....	.....	.....	.....	5,000	5,000
.....	.....	11,000	.....	11,000	10,000	OC	.....	8,000	12,000	.....	.....	.....
.....	.....	11,000	12,000	11,000	.....	8,000	.....	8,000	8,000	12,600	.....	.....
5,000	12,000	.....	12,000	.....	5,450	.....	.....	.....	.....	.....	.....	5,000
.....	.....	5,700	12,000	11,000	.....	.....	8,000	8,000	.....	.....	.....	.....
2,500	.....	5,700	.....	.....	.....	.....	OC	.....	.....	.....	.....	.....
5,000	.....	.....	.....	500*	.....	.....	.....	.....	.....	.....	.....	1,400
.....	.....	6,300	5,850	.....	.....	.....	8,000	4,000	A	.....	.....	4,500
2,500	1,000	1,475	1,500	1,500	1,500	.....	.....	6 M	6 M	.....	1,500	1,400
5,000	.....	.....	.....	.....	1,500	.....	.....	.....	.....	.....	.....	4,000
.....	.....	.....	3,350	3,100	1,500	.....	.....	.....	.....	.....	3,000	.....
2,500	.....	.....	.....	2,550	2,000	.....	.....	.....	.....	.....	.....	1,400
10,000	12,000	11,000	12,000	11,000	5,450	OC	8,000	.....	.....	.....	.....	9,000
1,250	9,000	1,475	1,810	1,550	1,475	1,050	.....	800	2,300	1,475	1,500	700
1,250	.....	2,850	1,810	.....	.....	.....	.....	800	2,100	.....	3,000	2,000
5,000	1,500	4,000	6,300	5,850	5,850	4,250	3,000	4,000	.....	.....	4,000	4,000
1,250	.....	3,500	1,810	1,550	2,950	.....	.....	.....	.....	2,900	4,500	1,400
1,250	.....	1,475	.....	.....	5,450	.....	.....	.....	.....	.....	1,500	1,000
.....	.....	.....	.....	.....	4,250	.....	.....	.....	.....	.....	4,500	.....
1,800	.....	.....	1,025	1,000	1,000	.....	.....	.....	.....	.....	.....	1,500
2,500	.....	.....	3,350	3,100	2,950	.....	.....	.....	.....	.....	.....	3,750
5,000	6,200	6,200	6,300	6,200	5,450	2,250	1,250	4,000	2,500	5,000	6,200	6,200
5,000	6,000	5,700	6,300	5,850	5,450	2,250	1,952	4,000	5,000	5,000	6,000	6,000
5,000	6,200	6,200	6,300	6,200	5,450	2,250	2,340	4,000	2,500	5,000	6,200	6,200
2,500	3,750	3,750	.....	3,750	2,000	1,500	1,000	2,000	1,500	2,000	1,000	2,625
5,000	6,200	6,200	.....	6,200	5,450	1,500	1,952	4,000	2,500	5,000	6,200	6,200
.....	1,500	1,600	.....	.....	.....	1,500	600	1,000	1,500	1,000	900	.....
2,500	1,500	1,600	.....	2,000	2,000	1,500	750	1,000	1,500	2,000	900	2,625
.....	.....	.....	.....	.....	.....	.....	.....	1,000	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	1,000	.....	.....	.....	.....
2,500	.....	.....	2,300	2,000	2,000	.....	.....	.....	.....	1,000	2,625	2625
5,000	6,200	5,700	6,300	5,850	5,450	2,250	3,000	3,000	5,000	3,000	5,500	5,500
5,000	6,000	5,700	6,300	5,850	5,450	2,250	1,562	3,000	5,000	3,000	.....	3,750
5,000	6,000	5,700	6,300	5,850	5,450	2,250	3,000	3,000	5,000	3,000	.....	3,750
5,000	6,000	5,700	6,300	5,850	5,450	2,250	5,000	3,000	5,000	5,000	3,750	3,750
5,000	6,000	5,700	6,300	5,850	5,450	2,250	4,000	4,000	5,000	5,000	5,500	5,500
5,000	6,000	5,700	6,300	5,850	.....	2,250	5,000	4,000	5,000	5,000	3,750	.....
10,000	6,000	11,000	.....	5,450	.....	.....	4,000	.....	.....	.....	.....	.....
5,000	9,000	11,000	6,300	.....	.....	2,250	4,000	4,000	.....	.....	8,000	8,000
5,000	6,000	5,700	6,300	5,850	5,450	2,250	3,000	5,000	5,000	5,000	6,000	6,000
5,000	6,000	5,700	6,300	5,850	5,450	2,250	5,000	4,000	5,000	5,000	6,000	6,000
5,000	6,000	5,700	6,300	5,850	5,450	2,250	3,000	4,000	5,000	5,000	6,000	6,000
5,000	6,000	5,700	6,300	5,850	.....	2,250	5,000	4,000	5,000	5,000	3,750	.....
.....	.....	5,700	6,300	5,850	5,450	.....	.....	.....	.....	.....	.....	.....
.....	.....	5,700	6,300	5,850	5,450	1,900	1,562	3,000	.....	2,000	5,500	5,500
.....	9,000	.....	6,300	5,450	.....	.....	.....	3,000	5,000	.....	3,750	.....
10,000	.....	.....	6,300	5,850	10,000	.....	.....	.....	.....	.....	.....	.....
.....	.....	3,000	.....	1,200	.....	.....	.....	.....	.....	.....	.....	5,000
.....	.....	3,000	.....	1,000	1,200	.....	.....	.....	.....	.....	.....	.....
5,000	.....	.....	.....	5,850	5,450	.....	.....	.....	.....	.....	.....	.....
5,000	.....	.....	6,300	5,850	5,450	2,250	.....	4,000	.....	5,000	6,000	6,000
5,000	.....	5,700	6,300	5,850	5,450	.....	.....	.....	.....	5,000	6,000	6,000
.....	.....	5,700	6,300	5,850	5,450	.....	.....	.....	.....	.....	.....	.....
.....	.....	6,300	.....	5,850	5,450	.....	.....	.....	.....	.....	.....	.....
2,500	.....	.....	.....	6 M	6 M	.....	1,200	150 D	120 D	.....	.....	.....
1,250	3 M	3 M	3 M	3 M	3 M	750	1,400	150 D	120 D	120 D	110 D	110 D
2,500	6 M	6 M	6 M	6 M	6 M	750	1,100	150 D	120 D	120 D	110 D	110 D
2,500	.....	.....	.....	6 M	6 M	750	1,400	150 D	120 D	120 D	110 D	110 D
2,500	OC	OC	.....	.....	OC	750	.....	.....	.....	5,000	.....	.....
OC	OC	6 M	OC	6 M	6 M	750	1,400	150 D	.....	.....	110 D	110 D
OC	OC	6 M	6 M	6 M	6 M	OC	OC	150 D	.....	.....	110 D	110 D
1,250	3 M	3 M	3 M	3 M	3 M	750	1,200	150 D	120 D	120 D	110 D	110 D
OC	.....	3 M	3 M	3 M	3 M	.....	.....	.....	120 D	.....	.....	.....
2,500	OC	.....	9 M	9 M	9 M	OC	.....	150 D	AO	5,000	180 D	180 D
2,500	6 M	3 M	6 M	3 M	3 M	750	1,200	150 D	120 D	120 D	110 D	110 D
.....	3 M	3 M	3 M	.....	.....	750	1,200	150 D	.....	120 D	110 D	110 D
2,500	.....	9 M	.....	9 M	9 M	.....	.....	.....	AO	.....	.....	.....

202 404	UAL				WAL		WCA	WIS	PANAGRA			FAA**					
	DC-4	DC-6	377	DC-3	DC-4	240	DC-3	DC-3	DC-3	DC-4	DC-6	DC-3	DC-4	DC-6B	240	049	377
1,200	1,400	1,500	800	1,300	1,400	1,300	1,150	700	1,200	1,500	1,200	1,300	1,500	1,000	1,100	1,000	1,000
1,475	4,200	3,000	1,400	3,900	4,000	1,400	2,300	700	2,400	2,600	1,200	2,600	2,600	1,200	1,100	2,000	1,400
2,500	2,500	3,000	1,600	2,600	2,800	1,300	2,300	700	1,200	3,000	2,400	1,300	3,000	2,000	2,200	1,000	2,000
1,200	1,400	1,500	800	2,600	2,800	1,300	1,150	700	1,200	1,500	1,200	1,300	1,500	1,000	1,100	1,000	1,000
1,200	1,400	1,500	800	1,300	1,400	1,300	1,150	700	1,200	1,500	1,200	1,300	1,500	1,000	1,100	1,000	1,000
2,400	2,800	2,400	1,600	1,300	2,800	2,600	1,150	700	1,200	3,000	2,400	1,300	3,000	2,000	2,200	1,000	3,000
1,200	1,400	1,500	800	1,300	1,400	1,300	1,150	700	1,200	3,000	2,400	1,300	3,000	2,000	2,200	1,000	3,000
1,200	2,800	3,000	1,600	1,300	1,400	1,300	1,150	700	1,200	3,000	2,400	1,300	3,000	2,000	2,200	1,000	3,000
1,200	1,400	1,500	800	1,300	2,800	1,300	1,150	700	1,200	3,000	2,400	1,300	3,000	2,000	2,200	1,000	3,000
1,200	2,800	1,500	1,600	1,300	2,800	2,600	1,150	700	1,200	3,000	2,400	1,300	3,000	2,000	2,200	1,000	3,000
1,200	2,800	1,500	800	1,300	2,800	2,600	1,150	700	1,200	3,000	2,400	1,300	3,000	2,000	2,200	1,000	3,000
2,500	5,000	4,500	.....	.....	4,000	4,000	3,450	3,000	8,000	3,300	3,600	3,900	3,300	3,000	2,250	2,000	3,000
2,000	.....	.....	.....	.....	1,400	.....	.....	.....	.....	3,000	.....	.....	3,000	.....	OC	.....	2,000
.....	2,800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,000	.....	.....	1,000	.....
5,450	4,200	4,500	.....	6,000	4,500	4,000	.....	2,000	.....	3,300	.....	3,000	3,300	5,000	4,000	1,400	4,800
.....	4,200	.....	1,300	.....	.....	.....	.....	120 D	.....	.....	.....	.....	.....	5,000	.....	2,400	3,300
.....	.....	.....	.....	OC	2,800	1,300	10,000	1,400	.....	.....	.....	OC	.....	.....	.....	1,000	.....
.....	1,300	.....	.....	2,600	2,800	1,300	1,150	700	.....	1,500	.....	2,600	1,500	1,000	1,100	.....	.....
.....	1,300	.....	.....	2,600	2,800	1,300	1,150	700	.....	1,500	.....	6,500	1,500	1,000	1,100	.....	.....
.....	11,200	.....	.....	.....	10,000	OC	10,000	6,000	4,000	.....	.....	5,500	.....	.....	OC	4,000	.....
10,000	5,600	.....	.....	11,000	4,000	4,000	10,000	6,000	8,000	.....	10,000	10,000	.....	.....	OC	10,000	.....
5,450	5,600	6,000	.....	5,000	5,000	OC	10,000	.....	8,000	OC	5,000	.....	2,500	5,000	OC	10,000	6,000
.....	5,600	9,000	.....	5,000	5,000	OC	10,000	.....	8,000	OC	6,000	10,000	5,500	6,000	OC	10,000	6,000
.....	.....	7,800	.....	OC	5,000	OC	.....	.....	.....	OC	.....	OC	.....	.....	.....	10,000	4,800
.....	.....	6,000	.....	.....	5,000	5,000	.....	.....	.....	.....	5,000	.....	.....	5,000	.....	.....	.....
.....	.....	.....	.....	.....	10,000	.....	.....	6,000	.....	8,800	.....	10,000	8,800	.....	OC	.....	.....
.....	.....	.....	.....	.....	10,000	.....	10,000	6,000	.....	9,600	.....	.....	9,600	5,000	.....	.....	.....
5,450	.....	6,000	.....	.....	5,000	5,000	.....	.....	.....	.....	5,000	.....	.....	5,000	3,000	.....	.....
.....	1,400	.....	.....	A	5,000	.....	.....	A	.....	5,000	.....	.....	5,000	.....	.....	OC	.....
500*	.....	3,000	500	.....	5,000	.....	.....	.....	.....	.....	500*	.....	.....	2,500	.....	4,000	.....
5,450	7,000	6,000	.....	A	5,500	.....	4,000	.....	.....	5,000	5,500	.....	8,000	5,500	.....	.....	.....
1,500	1,400	1,500	2,600	2,400	2,000	.....	.....	S. A.	.....	* 700	500*	.....	700*	1,300	OC	1,625	4,800
2,950	4,200	4,500	.....	2,400	2,000	.....	.....	S. A.	.....	* 1,400	.....	.....	1,400*	.....	2,000	.....	4,000
.....	4,500	.....	.....	2,000	.....	.....	.....	.....	.....	.....	2,500	.....	.....	.....	.....	.....	.....
5,450	11,200	OC	OC	.....	10,000	.....	10,000	6,000	8,000	9,600	10,000	2,500	.....	10,000	OC	OC	OC
1,475	1,400	1,500	1,300	1,300	1,200	1,300	.....	700	.....	1,800	1,800	1,300	1,800	1,800	OC	1,300	1,200
.....	2,800	3,000	5,200	2,500	2,500	2,600	.....	.....	.....	3,500	OC	1,300	5,000	5,000	OC	1,625	4,000
2,500	2,800	3,000	3,900	4,000	4,000	5,000	9,000	3,000	3,000	5,000	9,000	10,000	5,000	5,000	4,250	7,000	.....
5,450	1,400	1,500	1,300	3,500	3,500	1,300	2,000	.....	.....	3,500	2,500	.....	OC	OC	OC	2,400	4,800
.....	4,200	6,000	.....	.....	5,000	6,500	3,450	.....	.....	.....	5,000	.....	OC	5,000	OC	.....	.....
1,000	.....	2,000	.....	.....	.....	2,000	.....	.....	.....	.....	1,500	.....	.....	2,000	1,000	2,000	3,600
.....	.....	2,200	2,600	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	OC	.....	.....	.....
6,200	11,200	9,000	7,800	7,200	7,200	7,200	3,450	4,000	3,000	6,600	6,200	2,500	6,600	6,200	6,200	4,000	7,200
6,200	OC	OC	6,500	6,000	6,000	6,000	4,000	4,000	2,000	5,500	6,000	3,000	5,500	6,000	5,250	5,000	7,200
8,000	8,400	9,000	.....	7,200	7,200	7,200	4,000	4,000	2,000	6,600	6,200	2,500	6,600	6,200	6,200	5,000	5,000
4,000	4,200	3,000	2,600	3,000	3,000	3,000	4,000	2,000	2,000	6,600	6,200	2,500	6,600	6,200	6,200	5,000	5,000
8,000	8,400	7,500	7,800	7,200	7,200	7,200	4,000	4,000	2,000	6,600	6,200	2,500	6,600	6,200	6,200	5,000	5,000
3,500	1,600	1,500	1,000	1,000	1,000	2,000	1,500	1,000	2,000	2,500	3,000	1,300	2,500	3,000	.....	2,500	2,400
3,500	.....	2,400	2,400	1,000	1,000	2,000	1,500	1,000	2,000	2,500	3,000	1,300	2,500	3,000	.....	2,500	2,400
3,500	.....	.....	.....	2,000	.....	.....	.....	.....	.....	.....	.....	1,300	2,200	.....	.....	2,600	.....
4,500	.....	4,500	.....	2,000	2,000	.....	.....	.....	.....	3,300	OC	.....	2,300	3,000	3,000	3,300	2,400
8,000	5,600	7,500	6,500	5,500	6,500	4,500	4,000	3,000	2,000	5,000	5,500	3,000	5,000	5,500	3,000	3,300	5,000
8,000	5,600	6,000	5,200	5,000	5,500	5,000	5,000	3,000	3,000	5,000	5,000	3,000	5,000	5,000	3,000	3,300	5,000
8,300	5,600	6,000	5,200	5,000	5,500	5,000	5,000	3,000	3,000	5,000	5,000	3,000	5,000	5,000	3,000	3,300	5,000
8,000	8,400	12,000	.....	5,500	5,500	4,500	10,000	3,000	3,000	5,000	5,500	3,000	5,000	5,500	3,000	3,300	5,000
8,300	11,200	6,000	10,400	5,500	5,500	5,000	5,000	3,000	3,000	5,000	5,500	3,000	5,000	5,500	3,000	3,300	5,000
8,000	11,200	.....	.....	6,500	6,500	6,000	4,000	3,000	2,000	5,000	5,500	3,000	5,000	5,500	3,000	3,300	5,000
.....	11,200	.....	.....	10,000	10,000	8,000	10,000	3,000	2,000	9,600	.....	A	9,600	.....	.....	5,000	8,000
8,000	OC	OC	OC	5,500	6,500	6,000	4,000	4,000	2,000	5,500	5,000	3,000	5,500	5,000	OC	5,625	6,000
8,000	OC	OC	OC	5,500	6,500	6,000	4,000	4,000	2,000	5,500	5,000	3,000	5,500	5,000	OC	5,625	6,000
8,000	OC	OC	OC	5,500	6,500	6,000	4,000	4,000	2,000	5,500	5,000	3,000	5,500	5,000	OC	5,625	6,000
8,000	OC	OC	OC	5,500	6,500	6,000	4,000	4,000	2,000	5,500	5,000	3,000	5,500	5,000	OC	5,625	6,000
8,000	5,600	.....	OC	5,500	6,000	6,000	3,450	4,000	3,000	.....	.....	.....	5,000	5,500	.....	.....	.....
.....	7,000	12,000	10,400	5,500	5,500	5,000	4,500	3,150	3,000	5,000	5,500	2,500	5,000	5,500	4,500	3,300	.....
.....	5,600	7,500	5,200	5,000	5,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,000	.....
.....	5,600	.....	5,200	.....	.....	.....	.....	.....	3,000	4,000	.....	.....	4,000	.....	.....	4,000	.....
.....	5,600	.....	5,200	6,000	.....	OC	.....	.....	.....	4,500	.....	.....	4,500	.....	OC	2,000	.....
.....	.....	6,000	5,200	.....	.....	.....	.....	.....	.....	4,500	.....	.....	4,500	.....	OC	2,000	.....
.....	5,600	6,000	5,200	.....	.....	5,000	.....	.....	.....	3,300	OC	.....	3,300	.....	OC	3,750	6,000
.....	.....	6,000	5,200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
8,000	5,600	OC	OC	5,500	6,500	6,000	3,450	4,000	3,000	5,000	5,000	5,000	5,000	5,000	5,000	5,625	6,000
8,000	.....	.....	.....	.....	5,000	5,000	.....	4,000	3,000	5,000	5,000	5,000	5,000	5,000	5,000	5,625	6,000
.....	.....	.....	5,200	.....	.....	5,000	.....	.....	.....	3,300	5,000	5,000	3,300	.....	.....	5,625	.....
.....	.....	.....	5,200	.....	.....	5,000	.....	.....	.....	.....	5,000	.....	.....	.....	.....	.....	.....
.....	1,400	.....	1,300	100 D	100 D	100 D	1,150	90 D	OC	.....	1,600	2,600	2,500	2,600	.....	2,600	2,600
12 M	1,400	1,200															

Prepared by the Champion Spark Plug Co. from data submitted by the individual airlines for the

Engine Model	Aircraft Model	No. Aircraft	Airline	Type Spark Plug Adopted As Standard	Original Gap Setting	High or Low Tension Ign. System	Water Injection	Avg. Gap-Erosion Per 100 Hours	Max. Gap Allowed Before Removal (Overhaul)	Avg. Hours Total Plug Life	Max. CAA Approved Hours Before Removal (Overhaul)	Scheduled Hours Between Removals (Overhaul)	Actual Hours Between Removals (Overhaul)	Unscheduled Plug Removals Per 1000 Eng. Hours	Lead Content in CC/US Gal.	Fuel Octane Rating	Average Number Take-Offs Per 100 Hrs.	Engine Power During		
																		Take-off	Climb	Cruise
R-1820	DC-3	23	ANA	RS19-2R	.011-.014	HIGH	NO	.0011	....	800	....	200	190	2.0	4.58	90-100	50	1200	850	600
R-1820	DC-3	25	CAP	C35S	.011-.014	HIGH	NO	.004	....	450	260	130	125	3.3	3.98	90	150	1100	625	600
R-1820	DC-3	12	C&S	RC35S	.013-.016	HIGH	NO	.003	....	467*	575	300	260-26	2.5	4.04	91-98	108	1200	650	550
R-1820	DC-3	8	CAI	R37S-1	.011-.014	HIGH	NO	.003	....	750	325	250	200	.01	4.0	91	130	1100	600	550
R-1820	DC-3	20	DAL	R37S-1	.011-.014	HIGH	NO	....	....	400	300	300	....	....	....	91-100	120	1200	625	550
R-1820	DC-3	20	EAL	R37S-1	.011-.014	HIGH	NO	.0045	....	600	300	200	215	....	4.0	91-98	116	1200	650	600
R-1820	DC-3	9	WIS	R37S-1	.011-.014	HIGH	NO	.005	....	450	150	150	143	3.0	4.0	91-96	210	1200	625	625
R-1820	LODESTAR	11	NAL	R37S-1	.011-.014	HIGH	NO	.0015	....	700*	150	150	140	....	3.8-4.2	91-96	175	1200	625	550
R-1830	DC-3	12	AAA	RB27R	.011-.014	HIGH	NO	.002	....	600	ON COND.	180	150	2.0	4.01	91-98	220	48.0"HG	31.75"HG	30.0"HG
R-1830	DC-3	9	ANA	RS19-2R	.011-.014	HIGH	NO	.0011	....	800	....	200	195	2.0	4.58	90-100	50	1200	850	550
R-1830	DC-3	13	BNF	R37S-1	.013-.016	HIGH	NO	.004	....	....	400	300	....	6.16	4.0	100	115	1200	750	625
R-1830	DC-3	15	CPA	RB27R	.011-.014	.....	NO	.004	....	1000	....	250	....	.971	4.0-4.6	91-98	100	1200	785	550
				R37S-1	.013-.016			....	....	....	....			.138						
R-1830	DC-3	..	CAL	R37S-1	.013-.016	HIGH	NO	.0025	....	489	250	250	163	4.2	....	91	200	1200	600	550
R-1830	DC-3	12	FAL	R37S-1	.013-.016	HIGH	NO	.0015	....	740	ON COND.	300	226	1.0	4.0	91	154	1050	700	550
R-1830	DC-3	23	MCA	R37S-1	.013-.016	HIGH	NO	.004	....	....	ON COND.	175	90	....	4.0	91	101	1200	650	550
R-1830	DC-3	9	NEA	RB27R																
				R37S-1	.013-.016	HIGH	NO	....	....	600	350	350	335	2.3	3.5	91	167	1200	645	600
R-1830	DC-3	8	NWA	R37S-1	.013-.016	HIGH	NO	.003	.030	800	600	340	....	....	4.1	100	....	1200	650	575
R-1830	DC-3	13	PAI	R37S-1	.013-.016	HIGH	NO	.004	....	1200	300	300	300	2.1	4.0	91	200	1200	700	600
R-1830	DC-3	10	SOU	R37S-1	.013-.016	HIGH	NO	....	.019	675	380	285	300	3.0	4.0	91	225	1100	657	600
R-1830	DC-3	10	SWA	R37S-1	.015-.018	HIGH	NO	....	....	1200	450	410	400	.9	4.0	91	250	48.0"HG	30.0"HG	28.0"HG
R-1830	DC-3	24	TAA	R37S-1	.013-.016	HIGH	NO	.0035	....	650	230	200	180	2.3	4.7	91-96	60	1200	700	500
R-1830	DC-3	27	TCA	R37S-1	.011-.014	HIGH	NO	.002	....	750	....	275	250	1.3	3.4	91-98	80.5	1115	740	550
R-1830	DC-3	55	UAL	R37S-1	.013-.016	HIGH	NO	.003	....	800	ON COND.	300	275*	2.26*	4.0	91-98	200	1200	670	530
R-1830	DC-3	10	WAL	R37S-1	.013-.016	HIGH	NO	.002	....	900	ON COND.	....	350	1.3	4.0	90	163	1200	680	550
R-1830	DC-3	29	SABENA	RB19-R2	.013-.016	HIGH	NO	....	....	600	....	125	100	1.0	4.59	100-130	123	1200	675	600
R-1830	DC-3	35	AFB	RB19-2	.013-.016	HIGH	NO	....	....	500	....	250	230	....	4.5	100-130	48	1200	780	600
R-1830	DC-3/C-47	17	DO-BRAZIL	R37S-1	.011-.014	HIGH	NO	.003	.030	286*	....	275	115	6.24	4.6	91	64.1	1200	700	550
R-1830	DC-3/C-47	14	AERO-ARG	RB19R2	.013-.016	HIGH	NO	.002	....	1200	....	200	200	4.12	4.6	100-130	75	1200	780	600
R-1830	C-47	19	GARUDA	RB21R-1						1200										
				RB19R	.011-.014	HIGH	NO	....	....	250	....	100	....	....	....	100-130	62	48.0"HG	34.0"HG	28.0"HG
				RB27R																
R-1830	C-47	..	MATS	R37S-1	.011-.014	HIGH	NO	.0010	.014	....	....	200	200	....	4.6	100-130	20	1200	700	750
R-2000	DC-4	9	ANA	RS19-2R	.011-.014	HIGH	NO	.0013	....	800	....	200	195	3.0	4.58	100	32	1450	900	600
R-2000	DC-4	8	BNF	R37S-1	.013-.016	HIGH	NO	.005	....	....	400	225	....	1.80	4.0	100	93	1450	850	650
R-2000	DC-4	4	CPA	R37S-1	.015-.018	.....	NO	.004	....	750	....	250	....	3.46	4.6	100-130	14.3	1450	900	675
R-2000	DC-4	25	CAP	R37S-1	.013-.016	HIGH	NO	.004	....	390	260	130	125	.46	3.98	100	100	1450	835	660
R-2000	DC-4	4	CAI	R37S-1	.011-.014	HIGH	NO	.003	....	750	400	250	200	.005	4.15	100	60	1350	850	675
R-2000	DC-4	5	DAL	R37S-1	.011-.014	HIGH	NO	....	....	400	300	300	....	....	4.2	100	85.5	1450	30.0"HG	675
R-2000	DC-4	11	EAL	R37S-1	.011-.014	HIGH	NO	.004	....	600	400	300	320	....	4.0	91-98	78	1450	900	700
R-2000	DC-4	6	NAL	R37S-1	.013-.016	HIGH	NO	.0015	....	700*	400	150	140	NEGL.	4.2	100-130	80	1450	900	720
R-2000	DC-4	23	NWA	R37S-1	.013-.016	HIGH	NO	.003	.030	800	600	400	....	....	4.1	100	80	1450	900	680
R-2000	DC-4	19	PAA-LAD	R37S-1	.013-.016	HIGH	NO	.004	....	500	ON COND.	225	200	1.5	4.6	100-130	23.5	1450	900	700
R-2000	DC-4	4	TAA	R37S-1	.013-.016	HIGH	NO	.0035	....	650	260	200	123	1.37	4.7	100-130	35	1450	950	650
R-2000	DC-4	23	UAL	R37S-1	.013-.016	HIGH	NO	.003	....	800	ON COND.	200	275*	2.26*	4.0	100-130	17	1350	800	655
R-2000	DC-4	5	WAL	R37S-1	.013-.016	HIGH	NO	.004	....	900	ON COND.	....	350	1.8	4.0	100	46	1350	830	660
R-2000	DC-4	7	SABENA	RB19R-2	.013-.016	HIGH	NO	....	....	380	....	200-250	120	1.9	4.59	100-130	21.2	1450	920	675
R-2000	DC-4	27	AFB	RB19-2	.013-.016	HIGH	NO	....	....	500	....	250	230	2.0	4.5	100-130	33	1450	900	675
				R37S-1				.004	.030	600	....	300	250	.75						
R-2000	DC-4	6	AERO-ARG	RB19R-2	.013-.016	HIGH	NO	.002	....	1200	....	200	200	4.05	4.6	100-130	37	1450	950	900
				RB21R-1						1200										
R-2000	C-54	13	TWA	R37S-1	.011-.014	HIGH	NO	....	....	640*	....	410	....	1.67	4.0	100-130	37	1450	950	650
R-2000	C-54	12	TAL	R37S-1	.013-.016	HIGH	NO	.002	....	600	400	320	240	3.0	4.0	100-130	10	1450	875	625
R-2000	C-54	9	SB&W	R37S-1	.....	HIGH	NO	....	....	150	240	240	150	....	4.6	100-130	16	1350	1100	650
R-2000	C-54	..	MATS	R37S-1	.011-.014	HIGH	NO	.0010	.014	....	....	200	200	....	4.6	100-130	13	1350	850	675
R-2000	C-54	15	PAA-AD	R37S-1	.013-.016	HIGH	NO	.0024	.030	1000	ON COND.	500	400	1.1	4.2	100-130	20	1450	860	650
R-2000	C-54	10	FLY TIGER	R37S-1	.013-.016	LOW	NO	.005	....	1100	....	280	215	7.0	4.0	100-130	5	1350	....	650
												140	140	0				1450	1200	650

Climb	Cruise	Engine Speed During			Mixture Control Position			Min. F/A Cruise	Maximum Allowable Head Temp. Clim. °C	Minimum Climbing Air Speed M. P. H.	Allowable Head Temp. Cruise °C		Minimum Allowable Head Temp. Descent °C	Constant Carb. Air Temp. °C	Carburetor Air Temp. if not Constant °C		During Holding Procedure				Prior to Installation Are New Plugs			Is Anti-Seize Compound Used?	Is DC-4 Compound Used	% Plugs Scrapped At Overhaul		Plugs Overhauled Per Man Hour		
		Take-off	Climb	Cruise	Taxi	Climb	Descent				Max.	Min.			Min. Air Speed M.P.H. ³	Min. Engine Power ²	Min. F/A ³	Min. Head Temp. °C ²	Degraded	Electrically Tested	Gap Checked	Due Core Nose Breakage	Due Barrel Breakage							
50	600	2500	2000	1900	AR	AR	AL	...	218	130	205	...	100	...	...	...	130	480	...	160	...	...	YES	YES	NO	2	...	8-10	
25	600	2400	2000	1900	AR	AR	AL	...	232	120	204	93	...	21	38	...	120	300	...	93	NO	NO	NO	YES	NO	1/2	2	50		
50	550	2500	2050	1900	AR	AR	AL	.072	232	120	219	...	...	32	...	...	120	400	.072	...	NO	NO	NO	YES	NO	...	...	...
00	550	2250	1900	1800	FR	AR	AL	.075	232	120	204	149	93	...	...	...	120	500	.075	120	NO	YES	YES	NO	NO	0	0	8	
25	550	2500	2000	1900	AR	AR	AL	...	218	110	...	...	...	...	...	...	120	VAR.	...	...	NO	NO	NO	YES	NO	.002	NEGL.	10-12	
50	600	2500	2000	1900	AR	AR	AL	...	204	125	205	...	...	...	40	...	120	...	...	...	NO	SPOT	SPOT	YES	NO	NEGL.	NEGL.	12	
25	625	2500	2000	1900	AR	AR	AL	...	320	120	320	95	95	...	20	...	120	350	...	95	NO	NO	NO	YES	NO	1	3	10		
25	550	2500	2000	1900	AR	AR	AL	.075	200	140	200	...	...	...	...	...	130	...	.075	...	NO	YES	YES	YES	NO	1	1	15	
5" HG	30.0" HG	2700	2050	2050	AR	AR	AR	...	260	120	239	100	100	...	...	...	120	...	...	...	NO	YES	YES	YES	NO	1	...	10	
50	550	2700	2200	2050	AR	AR	AL	...	232	130	232	...	150	...	...	...	130	480	...	165	YES	...	...	YES	NO	2	...	9	
50	625	2700	2300	2050	AR	AR	AL	AL	232	...	232	...	...	...	38	...	...	...	...	...	NO	...	NO	YES	NO	NEGL.	NEGL.	21	
85	550	2700	2325	2050	AR	AR	AR	...	245	140	217	120	120	20	...	...	140	...	...	120	...	...	...	NO	NO	2	...	19	
00	550	2700	2100	2050	AR	AR	...	...	232	125	204	...	...	21	...	...	...	...	...	...	...	YES	YES	NO	NO	2	...	14	
00	550	2700	2150	2050	AL	AR	AL	.065	260	120	232	170	170	20	38*	-34*	120	450	.065	170	NO	NO	NO	YES	NO	0.3	.07	8.6		
50	550	2700	2050	2050	...	...	...	...	232	...	232	...	...	21	...	...	...	...	...	...	YES	YES	YES	YES	NO	NEGL.	NEGL.	24	
45	600	2700	2050	2050	AR	AR	AL	AL	260	120	232	99	93	...	40	...	120	...	...	AL	100	YES	YES	SPOT	YES	NO	3	...	23
50	575	2700	2050	2050	AR	AR	AL	.065	260	126	232	...	...	25	...	...	120	300	...	...	YES	NO	NO	NO	NO	NEGL.	NEGL.	...	
00	600	2700	2350	2050	AR	AR	AL	...	260	120	232	180	170	...	40	-10	130	500	...	AL	170	NO	NO	NO	YES	NO	NEGL.	NEGL.	20	
57	600	2700	2350	2100	AR	AR	AL	AL	260	120	235	120	120	...	65	45	...	...	...	...	NO	...	YES	YES	NO	1	5	5	
57	28.0" HG	2700	2050	2050	AR	AR	AL	.072	260	110	232	120	120	...	...	...	120	400	...	120	YES	YES	YES	YES	NO	UND 1	UND 1	24	
00	500	2700	2050	2050	AR	AR	AL	AL	230	130	230	180	180	...	...	...	126	450	...	AL	180	NO	YES	YES	NO	NO	NEGL.	NEGL.	...
40	550	2700	2325	2050	AR	AR	AL	...	260	110	232	120	120	20	...	...	87	...	...	...	120	YES	YES	YES	YES	NO	UND 1	NEGL.	12
70	530	2700	2050	2000	AR	AR	AR	.068	232	...	218	121	121	...	32	...	120	350	...	120	YES	YES	YES	YES	YES	NEGL.	NEGL.	32.6		
80	550	2750	2300	2050	AR	AR	AL	AL	204	120	163	...	...	...	...	...	...	...	...	...	...	...	YES	YES	NO	NEGL.	1	25	
75	600	2700	2050	2050	AR	AR	AR	.065	260	125	230	180	180	...	40	-15	130	...	...	AR	180	NO	YES	YES	YES	NO	2	...	6
80	600	2700	2300	2100	AR	AR	AR	.066	260	110	230	160	160	...	50	-25	110	400	...	AL	150	NO	NO	NO	YES	YES	.07	.4	10	
00	550	2700	2050	2050	AR	AR	AL	.072	260	125	232	...	...	...	40	...	120	450	...	.072	...	NO	NO	NO	YES	NO	...	...	4
00	600	2700	2350	2050	AR	AR	AR	...	232	120	232	140	140	...	...	...	120	600	...	AL	140	YES	YES	YES	YES	YES	3	6	5
00	28.0" HG	2700	2350	2050	AR	AR	AL	...	260	...	232	180	160	...	33	12	115	550	...	...	YES	YES	YES	YES	NO	...	6	5	
00	750	2700	2300	2000	AR	AR	AL	.060	260	110	232	150	150	...	38	15	110	...	...	.060	232	YES	YES	YES	YES	YES	...	...	9
00	600	2700	2250	1900	AR	AR	AL	...	232	150	232	...	150	...	...	...	150	480	...	...	170	...	...	YES	YES	NO	2	...	...
50	650	2700	2300	2150	AR	AR	AL	AL	232	...	232	...	...	...	38	...	...	...	...	...	...	NO	NO	NO	YES	NO	NEGL.	NEGL.	21
35	675	2700	2200	...	AR	AR	AR	...	260	155	232	...	...	25	...	...	150	400	...	...	...	...	...	NO	NO	.5	...	10	
50	660	2700	2200	1900	AR	AR	AL	...	232	140	232	121	...	...	38	...	140	400	...	120	NO	NO	NO	YES	NO	.5	2	50	
50	675	2700	2250	2050	AR	AR	AL	...	232	140	204	149	96	...	...	...	135	...	...	150	...	YES	YES	NO	NO	0	0	8	
00	675	2700	2300	2100	AR	AR	AL	...	232	130	...	...	...	...	...	...	140	...	...	...	...	NO	NO	NO	YES	NO	NEGL.	NEGL.	11
00	700	2700	2250	2050	AR	AR	AL	...	230	145	200	...	...	...	40	...	135	...	...	...	...	NO	SPOT	SPOT	YES	YES	NEGL.	NEGL.	12
00	720	2700	2300	2050	AR	AR	AL	.057	185	150	185	...	...	...	...	...	140	...	...	.057	...	NO	YES	YES	YES	NO	1	1	15
00	680	2700	2200	2100	AR	AR	AL	.065	260	148	232	...	...	25	...	...	145	500	...	AL	...	YES	NO	NO	NO	NO	NEGL.	NEGL.	...
00	700	2700	2200	2000	AR	AR	AL	.070	200	155	190	...	...	...	40	...	140	...	...	AL	...	NO	NO	NO	NO	NO	UND 1	UND 1	25
00	650	2700	2250	2050	AR	AR	AL	...	230	160	230	180	180	...	...	...	160	500	...	AL	180	NO	YES	YES	YES	NO	NEGL.	NEGL.	...
00	655	2700	2250	2050	AR	AR	AR	.067	217	...	217	120	120	...	40	30	128	400	...	...	120	YES	YES	YES	YES	YES	NEGL.	NEGL.	32.6
00	660	2700	2300	2050	AR	AR	AL	...	204	160	163	...	...	...	...	...	...	...	...	...	...	YES	YES	YES	YES	NO	NEGL.	1	25
00	675	2700	2550	2050	AR	AR	AR	.065	260	148	230	180	180	...	40	-15	145	...	...	AR	180	NO	YES	YES	YES	YES	2	...	6
00	675	2700	2550	2150	AR	AR	AL	.066	232	150	232	...	...	...	40	-25	140	425	...	.066	...	NO	NO	NO	YES	YES	.07	.4	10
00	900	2700	2250	2000	AR	AR	AR	...	232	140	232	205	205	...	...	...	140	...	...	AL	205	YES	YES	YES	YES	YES	UND 1	UND 1	14
00	650	2700	2300	2000	AR	AR	AL	...	232	...	232	...	...	...	38	...	...	...	...	...	...	NO	NO	NO	NO	NO	3	6	5
00	650	2700	2300	2000	AR	AR	AL	...	232	...	232	...	...	...	...	...	...	...	...	...	...	NO	NO	NO	NO	NO	3	6	5
5	625	2700	2250	2000	AR	AR	AR	AL	232	155	190	150	150	...	40	15	140	450	...	.064	150	YES	NO	YES	YES	YES	NEGL.	NEGL.	10
00	650	2700	2300	1900	...	...	...	AL	260	145	232	205	205	...	40	-30	140	37.5%	...	...	130	YES	YES	YES	YES	YES	...	20	14
00	675	2700	2550	2000	AR	AR	AR	...	232	140	200	180	150	...	...	...	140	27 11/2000	...	...	150	NO	NO	YES	YES	...	...	...	...
00	650	2800	2300	2050	AR	AR	AL	.060	232	155	232	220	100	...	32	15	155	...	...	.060	100	YES	YES	YES	YES	YES	...	...	...
00	650	2700	2300	1830	AR	AR	AL	...	220	145	220	180	170	140	450	170	NO	YES	YES	YES	YES	NO	NEGL.	NEGL.	25
00	650																													

Estimated figures are **bold**.

¹ Pressurized ignition system.

² Magnetos pressurized.

³ Distributors pressurized.

⁴ This is average for all types of aircraft used by this Airline.

⁵ New plugs used one run only and after overhaul installed in R-2000.

⁶ Ignition analyzer used to determine removals.

⁷ Harness in Alaska only.

⁸ Since December 1951 half of the fleet controlled and half full cold. Maximum and minimum outside air temp. on half the fleet.

NOTE—In computing unscheduled plug removals it was considered that any part of the set, up to one complete set, would constitute one removal.

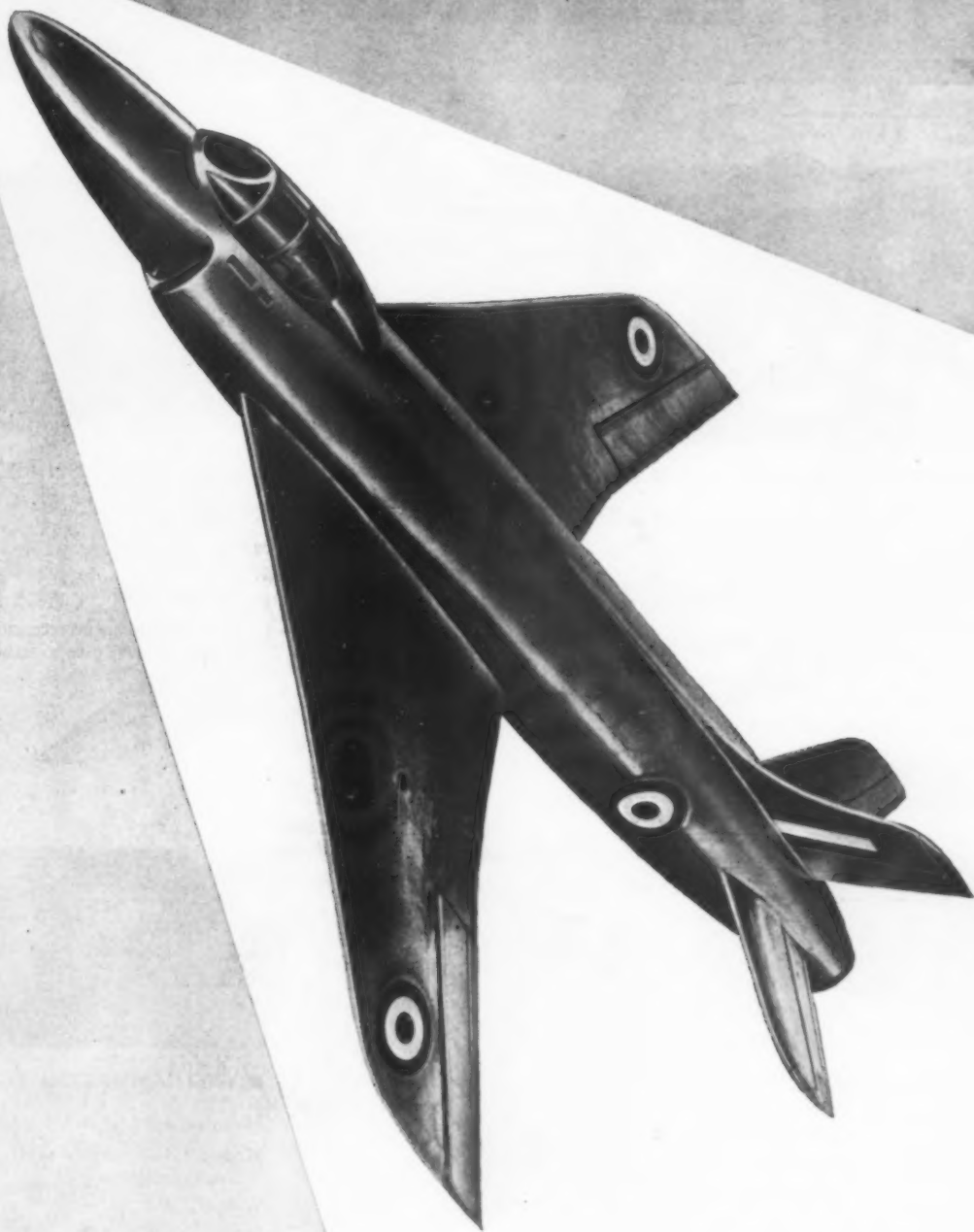
AAA—All-American Airways
AAL—American Airlines
AERO-ARG—Aerolineas Argentinas
AFA—Air France
ANA—Australian National Airways
AVIANCA—Aerovias Nacionales de Colombiana S. A.
BCPA—British Commonwealth Pacific Airlines
BNF—Braniff Airways
C & S—Chicago and Southern Air Lines
CAI—Colonial Airlines
CAL—Continental Air Lines
CAP—Capital Airlines
CPA—Capital Airlines
DAL—Delta
DO-BRA—Douglas
EAL—Eastern
FAL—Fleet
FLY TIG—Fleet
GARUD—Garuda
KLM—KLM
MATS—Matsuyama
MCA—McCauley
NAL—National
NEA—NEA

1350	1100	2800	2300	2100	AR	AR	AR	.073	232	...	232	200	150	..	..	....	150	....	....	150	NO	NO	NO	YES	YES	.9	4.4	20
1300	1040	2800	2300	2150	AR	AR	...	...	232	...	200	...	...	..	..	....	140	700	....	....	NO	YES	YES	NO	NO	.12	4.5	18
....	....	2800	2400	2000	AR	AR	AR	...	232	...	232	180	160	..	36	10	150	800	....	....	YES	YES	YES	YES	NO	1	....	16
1400	1000	2800	2400	2100	AR	AR	AL	...	210	160	210	190	140	..	20	....	150	800	....	180	NO	NO	NO	YES	NO	....	....	18
1350	1000	2800	2300	2100	AR	AR	AL	...	232	160	232	190	...	..	60	15	150	....	....	175	YES	YES	YES	YES	NO	NEGL.	NEGL.	24
1350	1000	2800	2300	2000	AR	AR	AL	AL	260	160	232	120	120	..	40	....	150	....	....	120	YES	YES	SPOT	YES	NO	NEGL.	NEGL.	23
1350	1200	2800	2400	2300	AR	AR	AL	.075	200	147	215	...	...	..	40	....	140	....	AL	....	NO	NO	NO	NO	NO	4	....	24
1360	1100	2800	2400	2340	AR	AR	AR	...	260	180	230	180	180	..	40	-15	145	....	AR	180	NO	YES	YES	YES	NO	UND 1	UND 1	25
																					NO	YES	YES	NO	NO	.6	....	24
1350	1000	2800	2300	2100	AR	AR	AL	AL	230	165	230	180	180	..	..	....	172	770	AL	180	NO	YES	YES	NO	NO	NEGL.	NEGL.	...
1350	1000	2800	2300	2050	AL	AR	AR	AL	230	160	200	...	...	..	..	....	...	....	....	....	NO	YES	YES	YES	YES	NEGL.	NEGL.	25
1400	1300	2800	2400	2165	AL	AR	AR	..	260	160	232	200	200	..	..	....	160	800	AL	200	YES	YES	YES	YES	YES	3	6	21
1400	1200	2800	2400	2200	AR	ML	ML	...	232	...	232	...	...	..	38	....	...	....	....	....	NO	NO	NO	YES	NO	6	15	...
1325	1080	2800	2400	2200	AR	AR	AR	...	232	150	200	190	140	..	40	15	160	1000	....	140	YES	YES	YES	YES	NO	4	....	...
1375	1080	2800	2300	2100	AR	AR	AL	...	232	...	232	...	...	..	38	....	...	....	....	....	NO	NO	NO	NO	NO	.1	.17	...
1350	1125	2800	2300	2100	AR	AR	AL	...	230	150	200	...	...	..	40	....	140	....	....	....	NO	SPOT	SPOT	YES	YES	NEGL.	NEGL.	...
1350	1000	2800	2200	2100	AR	AR	AR	.067	260	...	232	120	120	..	40	10	145	900	....	120	YES	YES	YES	YES	YES	NEGL.	NEGL.	32
1600	1150	2800	2400	2150	AR	AR	AL	.067	200	175	200	180	180	..	38	....	100	950	....	180	NO	YES	YES	YES	NO	4	.04	15
1200	950	2800	2400	2050	AR	AR	...	.065	230	160	185	175	175	..	40	....	155	650	.065	175	NO	NO	YES	YES	YES	....	....	...
1360	1000	2800	2400	2300	AR	AR	AR	...	260	160	230	180	180	..	40	-15	145	....	AR	180	NO	YES	YES	YES	NO	.4	....	24
1800	1100	....	....	....	AR	AR	AR	...	232	160	195	165	140	..	15	-3	170	1100	....	165	YES	YES	NO	YES	YES	1	1	6
1400	1080	2800	2400	2100	AR	AR	AL	...	232	160	232	180	200	..	40	....	150	....	....	180	NO	NO	NO	YES	YES	UND 1	NEGL.	11
1400	1050	2800	2450	2100	AR	...	...	.080	200	180	200	...	...	..	..	....	170	....	.080	....	NO	YES	YES	YES	NO	1	1	15
1400	1050	2800	2400	2200	AR	AR	AR	ML	210	175	200	200	170	..	20	....	180	750	....	100	NO	NO	NO	YES	NO	2	1	18
1350	1100	2800	2250	2200	AR	AR	AR	.073	232	...	232	200	150	..	..	....	150	....	....	150	NO	NO	NO	YES	YES	.9	4.4	...
																					NO	NO	NO	YES	NO	.12	4.5	20
1350	1100	2800	2450	2100	AR	ML	ML	...	232	...	232	...	...	..	38	....	...	....	....	....	NO	NO	NO	YES	NO	NEGL.	NEGL.	21
1350	1050	2800	2400	2150	AR	AR	AL	...	230	170	230	180	180	..	..	....	160	770	ML	180	NO	YES	YES	NO	NO	NEGL.	NEGL.	...
1360	1275	2800	2400	2020	AR	AR	AR	...	260	160	232	200	200	..	..	....	160	800	AL	200	YES	YES	YES	YES	YES	3	6	8
																					YES	YES	YES	YES	YES	6	15	5
1400	1200	2800	2300	2150	AR	AR	AL	.070	200	160	200	...	...	..	35	-10	140	....	AL	....	NO	NO	NO	NO	NO	UND 1	UND 1	25
1400	1200	2800	2400	2300	AR	AR	AR	.067	260	...	232	120	120	..	40	....	145	1000	....	120	YES	YES	YES	YES	YES	NEGL.	NEGL.	32
1800	1200	....	....	....	AR	AR	AR	...	232	180	232	180	140	..	38	15	180	1200	....	165	YES	YES	NO	YES	YES	....	....	...
1500	1200	2800	2400	2300	AR	AR	AL	.060	232	160	200	...	...	..	40	....	140	....	AL	....	NO	NO	NO	NO	NO	UND 1	UND 1	25
1500	1240	2800	2400	2200	AR	AR	AR	ML	210	175	200	200	170	..	20	....	180	750	....	170	NO	NO	NO	NO	YES	...	...	18
1400	1200	2800	2400	2300	AR	AR	AR	.073	232	...	232	200	150	..	..	....	155	....	....	150	NO	NO	NO	YES	YES	.9	4.4	...
88%	60%	2700	2300	1900	AR	AR	AR	...	230	140	190	155	...	..	40	5	145	....	....	....	YES	YES	YES	YES	NO	.12	4.5	20
																					YES	YES	YES	YES	NO	2	2	...
1175	950	2700	2300	1900	AR	AR	AR	AL	232	145	200	150	150	..	40	15	140	630	....	150	YES	NO	YES	YES	YES	NEGL.	.5	10
1360	960	2700	2300	1900	...	...	...	...	230	140	232	165	145	..	40	-30	167	....	....	145	YES	YES	YES	YES	YES	....	20	14
1360	950	2700	2300	1900	AR	AR	AL	.067	260	130	200	120	120	..	50	....	130	630	....	150	NO	YES	YES	YES	YES	4	.04	15
1200	900	2700	2200	1900	AR	AR	AL	.075	200	140	200	...	...	..	..	....	130	....	.075	....	NO	YES	YES	YES	YES	1	1	15
1450	1200	2800	2300	2000	AR	AR	AL	.060	232	180	232	...	...	..	40	....	140	....	AL	....	NO	NO	NO	NO	NO	UND 1	UND 1	25
1400	1100	2600	2300	2100	AR	AR	AL	...	232	...	232	...	...	..	38	....	...	....	....	....	NO	NO	NO	NO	NO	.1	.17	...
1400	1100	2800	2300	2000	AR	AR	ML	.063	232	184	232	...	...	..	40	....	130	....	.063	....	NO	NO	NO	NO	NO	....	....	4
1400	1100	2800	2300	2000	AR	AR	AL	...	232	185	232	...	...	..	38	....	150	400	....	....	NO	NO	NO	YES	NO	....	....	...
1470	1300	2800	2300	2100	AR	...	AL	...	200	175	180	...	...	..	25	....	160	600	....	....	NO	NO	NO	YES	YES	1	....	...
1470	1200	2800	2400	2100	AR	AR	ML	ML	200	175	200	...	145	..	..	....	185	800	....	....	NO	NO	NO	YES	NO	NEGL.	1	18
1470	1400	2800	2300	2300	AR	AR	...	...	230	165	185	...	...	..	40	....	155	....	....	....	NO	SPOT</						

CPA—Canadian Pacific Airlines
DAL—Delta Air Lines
DO-BRAZIL—DO-Brazil
EAL—Eastern Air Lines
FAL—Frontier Airlines
FLY TIGER—The Flying Tiger Line, Inc.
GARUDA—Indonesian
KLM—Royal Dutch Airlines
MATS—Military Air Transport Service
MCA—Mid-Continent Airlines
NAL—National Airlines
NEA—Northeast Airlines

NWA—Northwest Airlines
PAA—Pan-American World Airways
PAA-AD—Atlantic
PAA-LAD—Latin America
PAD—Pacific Alaska
PAI—Piedmont Airlines
PAL—Pioneer Air Lines
PIA—Philippine Air Lines
SABENA—Sabena
SAS—Scandinavian Airline System
SB&W—Seaboard & Western
SLICK—Slick Airways

SOU—Southern Airways
SWA—Southwest Airways



First of the New

The Supermarine Swift, a swept-wing fighter,
now in production for the Royal Air Force.

VICKERS-ARMSTRONGS LIMITED • SUPERMARINE WORKS • ENGLAND

OCTOBER 27, 1952

21



ELECTRONICS



● VHF NAVIGATION RECEIVER

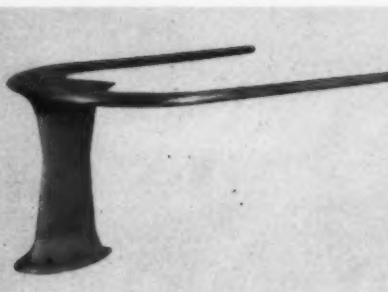
Manufacturer: National Aeronautical Corp.

Model: VTR-1 Omnigator

Weight: 18.3 lbs. installed

Dimensions: 10 $\frac{1}{4}$ " x 6 $\frac{7}{8}$ " x 5 $\frac{1}{2}$ "

General: An eight-channel VHF unit covering 108 to 127 mc. including VHF receiver, transmitter, VOR, VAR, marker beacon, and ILS localizer. (1*)



● VOR ANTENNA

Manufacturer: Collins Radio Co.

Model: 37J2

Weight: 5 lbs. 12 oz.

Dimensions: 27" x 17" x 12" (3*)



● VHF NAVIGATION RECEIVER

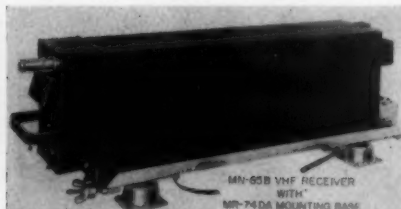
Manufacturer: Aircraft Radio Corp.

Model: 15D

Weight: 17.4 lbs. (or 25 lbs. installed)

Dimensions: 13 $\frac{1}{4}$ " x 11 $\frac{1}{8}$ " x 7 $\frac{1}{8}$ "

General: For airborne reception of VAR, VOR, and runway localizer, plus voice. (5*)



● VHF NAVIGATION RECEIVER

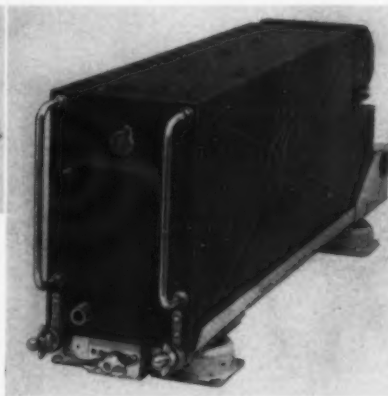
Manufacturer: Bendix Radio Div.-Bendix Aviation Corp.

Model: MN-85D

Weight: 27.6 lbs.

Dimensions: 25 $\frac{1}{4}$ " x 5" x 7.62"

General: A 280-channel unit covering 108-136 mc. using crystal control channel selection providing ILS, omnirange, and voice. (2*)



● VHF NAVIGATION RECEIVER

Manufacturer: Lear, Inc.

Model: LR-560

Weight: 20 lbs. approx.

Dimensions: 7 $\frac{3}{4}$ " x 19 $\frac{1}{8}$ " x 5"

General: A 560-channel unit covering 108-136 mc. in 10-mc. increments suitable for use with Lear Omni-pak or scopeless omni. Remote control provided. (4*)



● VHF NAVIGATION RECEIVER

Manufacturer: Collins Radio Co.

Model: 51R-3 (shown with 17L-3 VHF transmitter)

Weight: 29.5 lbs.

Size: $\frac{1}{2}$ ATR

General: A 180-channel unit covering 108-136 mc. providing ILS, omnirange, and voice. (6*)

* For more information, see pages 5 and 6.



You can look to Canadair as a permanent, reliable, fully authorized source for spare parts for C47/DC3 type aircraft.

Canadair has in stock thousands of components, assemblies, detail parts, accessories, hardware and vendor items; and requirements that cannot be filled from stock are being manufactured to latest specifications.

Servicing over 100 airlines in 45 different countries, Canadair lists among its clientele the world's foremost aircraft operators.

It will pay you to deal with Canadair
— an established Company with a world-wide reputation for dependable manufacture.

Write, wire or phone:

Canadair
LIMITED, MONTREAL, CANADA

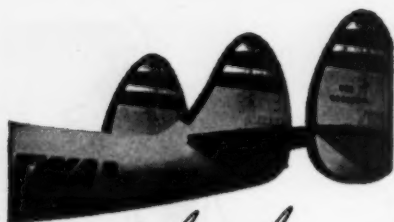


We will gladly mail you the Canadair brochure on spare parts.

A subsidiary of
GENERAL DYNAMICS CORPORATION
(Formerly: Electric Boat Company)
New York, N.Y. — Washington, D.C.



CASB-13UBT



Ambassador

**SUPER-CONSTELLATIONS
FLY FULL-EQUIPPED WITH**

**TECO AIRLINE
SEATS and BERTHS!**



**NEWEST TWA LUXURY FLEET
OFFERS FINEST COMFORT and
BEAUTY WITH TECO-BUILT SEATS
and BERTHS FOR CABIN and
SLEEPER SERVICE!**



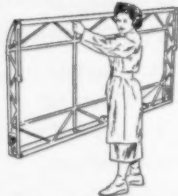
TECO's formula for producing the finest airline seats has been carried further in the all-new, light weight, full sized Model 320 airline berth.

Miss Mary L. Bullock, Superintendent of Hostesses, Western Region, says: "We are delighted with the TECO airline seats and berths installed in our newest TWA Ambassador Connies. Seating comfort

is tops and berths make up faster and easier than ever before. Time studies have proven that our hostesses are able to handle and make up a berth in less time — and without fatigue!"

**BUILT FOR ECONOMY, EASE OF
OPERATION AND TOP COMFORT!**

The TECO Model 320 airline berth combines a light weight, welded steel tubular frame, patented counter-balance, simplified linkage and standard aircraft and automotive parts to make this the outstanding airline berth!



For specific information on the TECO 320 berth, write: Transport Equipment Co., 2501 North Ontario Street, Burbank, California.

manufactured by
TRANSPORT EQUIPMENT CO.
Burbank • California

REPRESENTED IN CANADA BY:
RAILWAY & POWER ENGINEERING CORPORATION
LIMITED • 3745 St. James Street • Montreal 30, P. Q.

VHF Omnirange



● RADIO MAGNETIC INDICATOR

Manufacturer: Collins Radio Co.

Model: 332C-1

Weight: 2 lbs.

Dimensions: 3" face

General: Operating on signals from VOR ranges, the indicator provides heading and course information with reference to the station to which the omni bearing receiver is tuned. This is essentially the same function served by LF ADF or radio compass equipment. (7*)



● OMNI-BEARING SELECTOR

Manufacturer: Collins Radio Co.

Model: 336A-2

Weight: 2 lbs.

Dimensions: 3" instrument face

General: With the VOR navigation receiver tuned to the frequency of a given range station, the magnetic bearing selector is turned until the vertical needle of the deviation indicator centers. This locates the aircraft's azimuth heading to the station. (9*)



● RADIO MAGNETIC INDICATOR

Manufacturer: Eclipse-Pioneer, Div. of
Bendix Aviation Corp.

Model: 36105

Weight: 2 lbs., 8 oz.

Dimensions: 3 1/4" dia. x 5-3/32" long

General: Operates on 26-volt, 400-cycle, single-phase alternating current, using signals from omniranges and flux gate or gyrosyn compass or performs ADF functions similar to those described above. Includes provision for transmitting heading information to repeaters. (8*)



● OMNI-BEARING INDICATOR

Manufacturer: Collins Radio Co.

Model: 337A-2

Weight: 2.5 lbs.

Dimensions: 3" instrument face

General: Presents a continuous indication of aircraft bearing relative to omnirange station. (10*)

* For more information, see pages 5 and 6.

AMERICAN AVIATION



—FLIES THE TOP OF THE WORLD with THE WORLD'S TOP SPARK PLUGS!



Specially designed landing gear helps this DC3 get its heavy cargo safely into tricky landing areas.



Power equipment being loaded into a Maritime Central Airways' plane for transport to Labrador.



This PBY-5A amphibian Canoe is used for long chartered hauls into areas that have no landing fields.



M.C.A. has logged millions of miles over snow-covered mountains in scheduled and chartered flights.



The RC26S and R37S-1 are the most widely used of Champion's many types of aircraft spark plugs.

"Flying the vast expanses of the North leaves no margin for mechanical error. You quickly learn that dependability is imperative in all your equipment.

"Obviously, spark plugs are of vital importance to us, and the dependability of Champion Spark Plugs, used in all M.C.A. aircraft, is priceless. We heartily endorse them."

Capt. Carl F. Burke, Owner and Managing Director
Maritime Central Airways, Ltd.



Mining equipment to Yellow Knife, dynamite to Labrador or passengers to the Magdalen Islands—Maritime Central Airways, lifeline of the Canadian North-east, will fly anything anywhere—and does!

So well does M.C.A. carry out the colorful assignments of frontier aviation that, in ten years, it has become a major Canadian airline. Headquartered at Charlottetown, Prince Edward Island, M.C.A. flies scheduled routes covering the Maritime Provinces and charters to any point in North America.

Whatever your spark plug requirements—

there is a Champion spark plug tailor-made to give you the best performance, the greatest economy, and the maximum dependability of which your engine is capable.

CHAMPION SPARK PLUG COMPANY, TOLEDO 1, OHIO

SPECIFY

CHAMPIONS

AND FLY WITH CONFIDENCE

VHF Communications

Engineering Data

Unit Name	Model	Manufacturer	General Purpose	Weight	Dimensions Length-Width-Height	Range	Channels
Transmitter	17L-3	Collins	Communication	22 lbs.	½ ATR	118.0-135.9 mc.	180
Transmitter	T-13A	Aircraft Radio Corp.	"	3.4 lbs.	6 1/16"x4 15/16"x 5 3/4"	125-148mc.	5
Transmitter	LTR-360	Lear, Inc.	"	20 lbs.	7 3/4"x19 5/8"x5"	118.1-136 mc.	360
Receiver	R-19	Aircraft Radio Corp.	"	9 lbs.	11 3/8"x4 15/16"x 5 3/4"	118-148mc.	5
Receiver	RA-18	Bendix Radio	"		19.68"x5.00"x7.81"	118-135.9 mc.	360
Receiver	LR-6	Lear, Inc.	"	5 lbs. 7 oz.	3 7/16"x6 7/16"x 7 11/16"	108-127mc.	
Receiver	R-15	Aircraft Radio Corp.	"	9 lbs.	11 3/8"x4 15/16"x 5 3/4"	108-135mc.	
Transmitter-receiver (plus LF receiver)	LTRA-6	Lear, Inc.	"	14 lbs. 7 oz.	5 1/8"x6 7/16"x 7 11/16"	200-400kc. 500-1600kc. 75 mc. 108-127mc.	12
Transmitter-receiver	LTTR-6	"	"	14 lbs. 7 oz.	5 1/8"x6 7/16"x 7 11/16"	118-126mc.	24
Transmitter-LF receiver	LTA-6	"	"	11 lbs. 10 oz.	5 1/8"x6 7/16"x 7 11/16"	200-400kc. 550-1600kc.	12
Transmitter-receiver	LTR-6	"	"	13 lbs. 1 oz.	5 1/8"x6 7/16"x 7 11/16"	108-127mc. 75 mc.	12



● VHF TRANSMITTER-RECEIVER

Manufacturer: Wilcox Electric Co. Inc.
Model: 440-A

Weight: 77 lbs., 13 oz.

Dimensions: 1½ ATR complete

General: A 180-channel VHF communications system covering 118-136 mc. for air-ground communication. Includes transmitter, receiver, and power supply. (11*)

● VHF TRANSCEIVER

Manufacturer: Lear, Inc.

Model: LVTR-36

Weight: 20 lbs. (approx.)

Dimensions: 19 3/8" x 17 3/4" x 5"

General: A 36-channel VHF transmitter and receiver combination covering range from 118 to 127 mc., providing 72 crystal-controlled channels. (12*)



● VHF TRANSMITTER

Manufacturer: Collins Radio Co.

Model: 17M-1

Dimensions: Full ATR

General: A 360-channel VHF transmitter covering 118.9 to 135.95 mc. (13*)

● VHF TRANSCEIVER

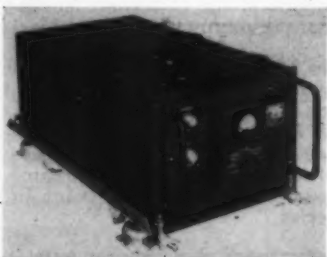
Manufacturer: National Aeronautical Corp.

Model: VHT-2

Weight: 10.2 lbs., installed

Dimensions: 10 1/4" x 6 7/8" x 5 1/2"

General: A four-channel transmitter and receiver combination covering range from 108 to 127 mc. (14*)



● VHF TRANSMITTER

Manufacturer: Bendix Radio, div. of Bendix Aviation Corp.

Model: TA-18 BB

Weight: 43 lbs.

Dimensions: 24.5" x 9.26" x 10.24"

General: A 360-channel VHF transmitter of 25-watt output covering 118.0 to 135.9 mc. (15*)

● VHF TRANSMITTER

Manufacturer: Aircraft Radio Corp.

Model: T-11B (see chart for other models)

Weight: 3.4 lbs.

Dimensions: 6 11/16" x 4 15/16" x 5 3/4"

General: A five-channel, air-ground transmitter covering 116-132 mc. (16*)

● VHF TRANSMITTER

Manufacturer: Lear, Inc.

Model: RT-10E

Weight: 10 oz.

Dimensions: 3 3/8" x 3 3/8" x 7 3/8"

General: A 12-channel VHF transmitter unit for instrument hole mounting. (17*)

* For more information, see pages 5 and 6.

of ALL the world's



International Airlines*



AVIATION PRODUCTS

The ESSO winged oval, symbol of leadership in aviation petroleum service, is backed by more than 45 years of aviation experience including many pioneering achievements.

It was an ESSO refinery that supplied the gasoline for Orville Wright's historic flight at Kitty Hawk, North Carolina on December 17, 1903. Since then, ESSO Aviation Products have played an ever-increasing part in the advancement of aviation.

In 1944, the first aviation engine test unit, specifically designed to test fuels and lubricants in full-scale aircraft engines, was inaugurated at the ESSO refinery in Bayway, N. J.

Meeting the exacting requirements of modern air trans-

portation, ESSO marketers were also the first to develop and expand the use of the Hydrant Refueling System. Today, even at such widely separated airports as Gander (Canada) and Don Muang (Thailand), the ESSO winged oval guarantees safe, fast, dependable petroleum service to all aircraft.

Around the clock, around the world ESSO Aviation Products are available where you want them, when you need them.



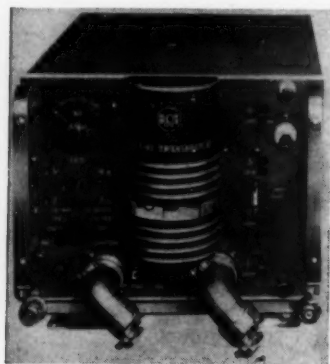
A GOOD SIGN TO FLY TO

*As listed by: C.A.B. "World Directory of Airlines" and International aviation trade press

LF and HF Communications

Engineering Data

Unit Name	Model	Manufacturer	General Purpose	Weight	Dimensions Length-Width-Height	Range	Channels
Receiver	AVR-22	RCA		21 lbs.	½ ATR	150- 420kc. 550-1620kc. 2830-8050kc.	Tunable
Transmitter	TA-17B	Bendix	Crystal-controlled HF communications transmitter 2.85 mc. to 12.5 mc.	36.12 lbs.	22.18"x10.25" X7.87"		4
HF transmitter-receiver	18S-4	Collins	Communication	55 lbs.	1½ ATR	2.0-18.5 mc.	20



● TRANSMITTER

Manufacturer: Radio Corp. of America

Model: AVT-49

Weight: 42 lbs., 7 oz., installed

Dimensions: Full ATR

General: A four-channel transmitter with 50-watt output, completely self-contained, including power pack, vibrator power supply, etc. Four independent frequencies ranging from 3,000 to 13,000 kc., with provisions for frequencies down to 2,850 kc. (18*)



● TRANSCEIVER

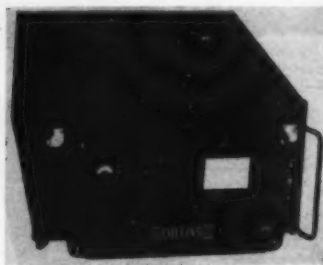
Manufacturer: National Aeronautical Corp.

Model: VTLR-1 and -2 (shown)

Weight: 7.4 lbs.

Dimensions: 10¼" x 6⅞" x 5½"

General: An LF radio and range receiver with an eight-channel VHF transmitter. Model -1 covers the frequency range of 200-400 kc. and -2 covers the range of 550-1,500 kc. (19*)



● TRANSMITTER-RECEIVER

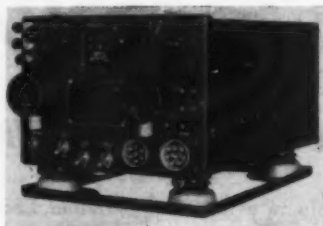
Manufacturer: Collins Radio Company

Model: 618S-1

Weight: 60 lbs.

Dimensions: 21¼" x 15⅝" x 7¾"

General: A 144-channel HF transmitter-receiver covering a frequency range of 2.0 to 25.0 mc. (20*)



● RECEIVER

Manufacturer: Aircraft Radio Corporation

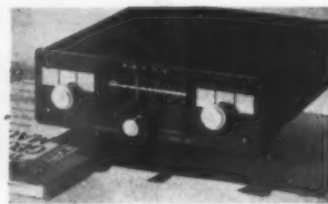
Model: RA-1B

Weight: 25.1 lbs.

Dimensions: 16.12" x 9.81" x 8.87"

General: A tunable communications receiver covering frequency ranges of 0.15 to 1.5 mc. and 1.8 to 15.0 mc. Sensitivity: cw-2mv mcw to 5 mv; 50 mw output. (21*)

* For more information, see pages 5 and 6.



● RECEIVER

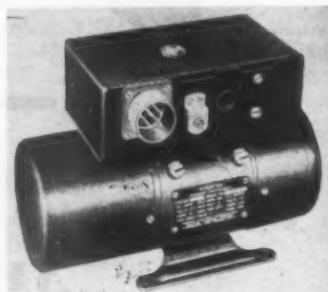
Manufacturer: National Aeronautical Corp.

Model: LFR-1

Weight: 2 lbs., 3 oz.

Dimensions: 6⅞" x 6½" x 2⅞"

General: Miniaturized LF range and broadcast receiver covering 200-400 kc. and 500-1,500 kc. range. Used independently or as VHF accessory. (22*)



● INVERTER

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 12142

Weight: 13 lbs. (approx.)

Dimensions: 9¼" x 3¾" x 6¼"

General: Designed in accordance with Navy Spec. 17-1-58 as a frequency and voltage regulated unit operating on 26-29 volts and delivering 115 volts, 400 cycles, at 250va. Single and three phase can be operated from this model simultaneously under certain conditions. (23*)

WHO PUTS THE *Air* IN AIRCRAFT

Putting air to work *inside* aircraft is a Stratos specialty. Stratos designed and manufactured pneumatic equipment is serving vital functions in many military and commercial aircraft.

Whether it be the pressurizing and air conditioning of a modern transport, cooling the cockpit of a sonic fighter or operating indispensable accessories in a jet bomber, Stratos precision-engineered equipment meets the requirement. Stratos pressurization and cabin air conditioning systems are used by leading domestic and international airlines. Stratos air-cycle refrigeration units cool the fastest Air Force and Navy jet fighters and bombers. Light-weight Stratos air-turbine drives provide dependable power for accessories in jet night fighters and bombers.



AIR-TURBINE DRIVES
from 3 to 100 hp.



CABIN SUPERCHARGERS
from 20 to 75 lbs/min air flow



BOOTSTRAP AIR-CYCLE
REFRIGERATION
from 20 to 75 lbs/min air flow



JET BLEED REFRIGERATION
FOR FIGHTERS
from 10 to 30 lbs/min air flow



JET BLEED REFRIGERATION
FOR BOMBERS
up to 100 lbs/min air flow



Stratos

DIVISION

FAIRCHILD ENGINE & AIRPLANE CORP.

Main Office and Plant: Bay Shore, Long Island, N. Y. • West Coast Office: 1355 Westwood Blvd., Los Angeles 24, Calif.

Other Divisions: Aircraft Division, Hagerstown, Md. • Engine Division, Farmingdale, N. Y. • Guided Missiles Division, Wyandanch, Long Island, N. Y.



LIFTON PILOT BAG

A Special Designed Flight Kit. Universally used by airline pilots, has adequate inside compartments and pockets for computers and flashlight—outside pocket for maps and charts.

- Made of Top Grain Cowhide
- Heavy Zipper
- Color—Black
- Will give years of service.

PRICE \$37.75

plus U.S. Federal Excise Tax of 20%

WRITE:

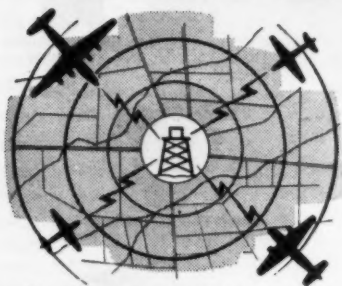
AERONAUTICAL REPRESENTATIVES

P. O. Box 54
Miami International Airport Branch
Miami, Florida

Pilot Equipment—Navigation Equipment—Emergency Equipment.

We invite inquiry from Airlines on quantity purchase.

OMNI's for ALL



and all get OMNI with ARC's VHF Equipment

Pilots of private, executive or transport aircraft enjoy the safety of OMNI with ARC's compact Type 15C VHF Navigation Equipment. It takes the work out of navigation—gives a reliable signal to follow, whatever your bearing to or from the station. No worry about drift, no static interference. Type 15C also provides for use of visual-aural ranges, and runway localizers. All ARC airborne equipment is CAA type certificated and designed for reliability and performance, not to meet a price. Write for all details.

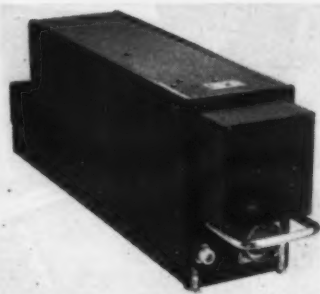


AIRCRAFT RADIO CORPORATION
Boonton New Jersey
Dependable Electronic Equipment Since 1928

ILS Equipment

Engineering Data

Unit Name	Model	Manufacturer	Weight	Dimensions Length-Width-Height
Communications antenna	37R-1	Collins Radio	3.4 lbs.	22"x4"x10 1/2"
Antenna tuner	180L-2	"	20 lbs.	13 3/8"x10 5/16"x7 1/4"
"	180K-3	"	12.8 lbs.	10 1/8"x10 1/8"x7 1/4"



• GLIDE SLOPE RECEIVER

Manufacturer: Wilcox Electric Co.

Model: 429A

Weight: 23 lbs., 10 oz.

Dimensions: 1/2 ATR complete

General: A 20-channel glide slope receiver 329.3-335 mc. Available for a-c or d-c power. (24*)



• GLIDE SLOPE RECEIVER

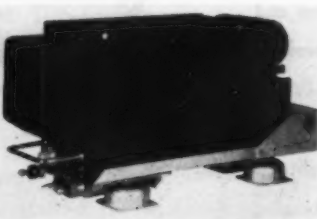
Manufacturer: Aviation Accessories, Inc.

Model: R-89M

Weight: 12.5 lbs.

Dimensions: 14" x 5 1/4" x 7 3/4"

General: A six-channel glide slope receiver covering range from 322-335 mc. (27*)



• GLIDE SLOPE RECEIVER

Manufacturer: Collins Radio Co.

Model: 51V-1

Weight: 15 lbs.

Dimensions: 1/2 ATR

General: A 20-channel glide slope receiver covering the range of 329-335 mc. (25*)



• CROSSPOINTER INDICATOR

Manufacturer: Weston Electrical Instrument Corp.

Model: 1D-48

Weight: 1 lb., 14 oz.

General: Standard 3" instrument mounting. Instrument includes warning flags. Standard instrument used for instrument landing systems. (28*)

• GLIDE SLOPE ANTENNA

Manufacturer: Collins Radio Co.

Model: 37P-2

Weight: 1.4 lbs.

Dimensions: 5 1/2", 4 1/2", 2" (26*)

* For more information, see pages 5 and 6.

AMERICAN AVIATION

Several of the Hobart "Power-Pulls" used by American Airlines at Chicago's Midway Airport

For Better GROUND POWER Service



HOBART "POWER-PULL" Like American — Eastern, Trans World, United, National, Capitol, Northwest, Trans-Canada, Continental and many others are using the "POWER-PULL." Why? Because they have found the "POWER-PULL" answers their ground power requirements — a matter of vital importance — in a quicker, less expensive and more efficient manner.

To help speed your increased schedules you need the "POWER-PULL" — chiefly for these reasons . . .

- Mobile under its own power.
- Propulsion is by a standard automotive type clutch, transmission and tractor axle assembly.
- The Chrysler 6-cylinder engine not only provides plenty of power for propulsion, but also drives the 600 amp, 28.5 volt generator—all with steady dependability.
- The front axle has an inside wheel turning angle of 35 degrees which allows maximum maneuverability around aircraft.
- It includes all necessary protective devices for the safety of the airplane—is furnished complete even to output cable and plug. Nothing additional is needed to put it into service.

Here's why you'll want to standardize on the Hobart "POWER-PULL" . . .

PRICE is well within your operating budget.

CAPITAL investment is less. You save \$1000 and up over buying a tractor and a trailer mounted power unit of the same generator rating.

UTILITY is remarkable. Although it is not intended as an airplane towing tractor, you can, in an emergency, tow a Constellation or lighter airplane.

QUALITY is predominant—service is outstanding—and with reasonable maintenance the life is many years.

CAPACITY of the generator is sufficient to handle the engine starting and electrical load requirements of the Constellation 1049, DC-6, and smaller airplanes.

A COMPLETE LINE OF GROUND POWER UNITS

**ELECTRIC
MOTOR
DRIVEN**



Available in capacities of 300, 600, 1000 amperes at 28.5 volts, continuously rated. For shop and hangar use where electric power is available.

**GAS
ENGINE
DRIVEN**



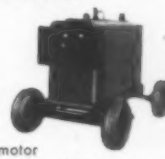
Portable trailer type available in same capacities. For flight line, or other uses independent of electric power.

**JET
STARTING**



All models can be supplied with either of two methods of jet starter control—constant voltage, constant current—or constant voltage with current limiting features.

**400
CYCLE**



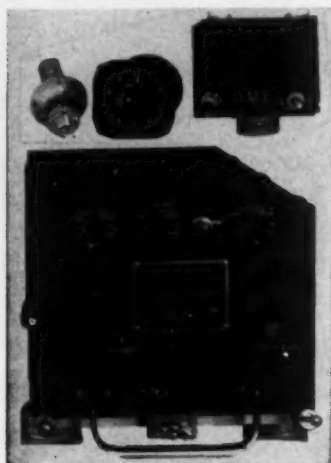
Electric motor or gas engine driven generators for generating 400 cycle. Capacities of 3, 5, 10, and 30 KW. Close voltage and frequency regulation.

We are prepared and ready to give you good delivery. Write, wire or phone us now.



MOTOR GENERATOR CORPORATION
Box AA-102, Troy, Ohio (HOBART BROTHERS AFFILIATE)

Additional Communications



● DISTANCE MEASURING EQUIPMENT

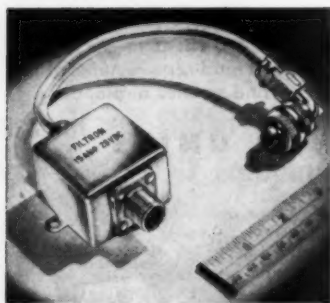
Manufacturer: Federal Telecommunications Laboratory

Model: FTL-34A

Weight: 57 lbs., 5 oz.

Dimensions: 7" x 10" x 19"

General: Provides pilot with direct reading of distance to ground station on clock type instrument face. Works in conjunction with VOR equipment. (29*)



● R F FILTERS

Manufacturer: The Filtron Co., Inc.

General: A 15-amp, 28 volt, d-c radio frequency interference filter for aircraft applications. Hermetically sealed. High attenuation for 150 kc. to 450 mc. (30*)

● DISTANCE MEASURING EQUIPMENT

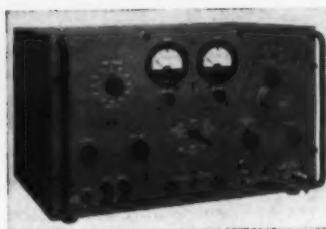
Manufacturer: National Aeronautical Corp.

Model: DIC

Weight: Under 30 lbs.

Dimensions: Not available.

General: Developed under CAA contract. Crystal-controlled, 100-channel operation. Provides pilot with direct reading of distance up to 100 miles from ground station. (31*)



● SIGNAL GENERATOR

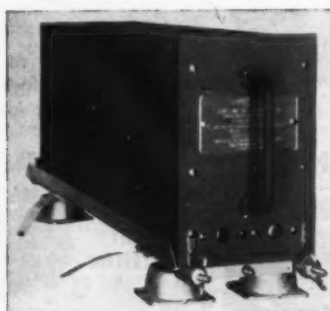
Manufacturer: Aircraft Radio Corp.

Model: H-14

Weight: 39 lbs.

Dimensions: 10½" x 17⅞" x 12¼"

General: Provides signals of known frequency, amplitude, and modulation for quantitative tests of VHF equipment, including ILS localizer and omnirange. (32*)



● AIRCRAFT PAGING AMPLIFIER

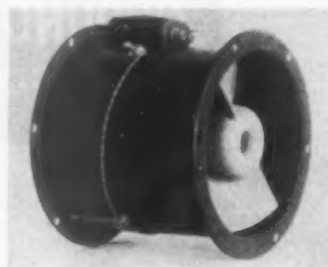
Manufacturer: Bendix Radio, Div. of Bendix Aviation Corp.

Model: MI-36A

Weight: 12.25 lbs.

Dimensions: 21.43" x 5.0" x 7.81"

General: A 20-watt-output amplifier for use in aircraft public address systems. (33*)



● AIRCRAFT BLOWER

Manufacturer: Dynamic Air Engineering, Inc.

Model: M 4381 B-1B

Weight: 1.75 lbs.

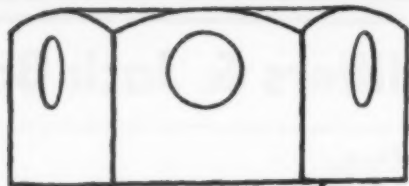
Diameter: 4.5"

General: Providing 110 cu. ft./min. of air at 4" Hg. static pressure, the Dynamic model M 4381B-1B is used on Westinghouse and Bendix equipment for electronic cooling. Operating on 27-volt d-c and 400-cycle a-c, it is a single-stage blower. (34*)



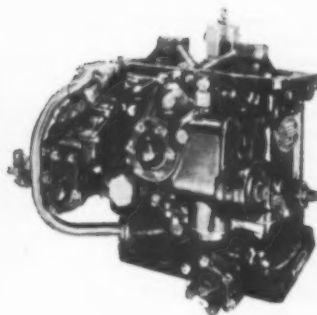
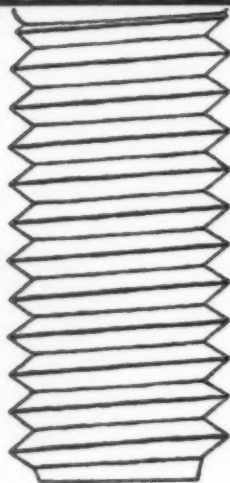
RADOMES, such as the Keller Products, Inc., unit shown here, are made of reinforced Fiberglass plastic and used to protect electronic equipment and instrumentation. Another major supplier of Radomes is B. F. Goodrich. (35*)

* For more information, see pages 5 and 6.



the Smaller the part

THE BIGGER THE STORY!



• Attention to detail, even the smallest part or procedure, is another reason why aircraft operators everywhere "Send it to Airwork". Engines and accessories overhauled in the Airwork shops set new standards of dependable operation—Certificated Air Carriers have received time extensions of as much as 55% from CAA after switching to Airwork.

From our Millville or Miami offices, you can receive prompt delivery of products from the following leading manufacturers—Bendix Products Division, Bendix Eclipse-Pioneer, Bendix Scintilla, American Brass, B.G., Champion, Continental, Jack and Heintz, Minnesota Mining and Mfg. Company, Packard Cable, Pratt and Whitney Aircraft, Pesco, Turco Products, Thompson Products, Titeflex, Romec, Co-Operative Industries and U.S. Rubber Company.



• Now 19 Class "A" Airwork Dealer Service Stations! From Michigan to Miami conveniently located Airwork dealers offer interesting accessory and engine exchange programs for Executive aircraft owners — Immediate delivery of vital parts saves time; protects owners from obsolescence and assures them of finest quality. Write to our Millville office today for a list of these Airwork Dealers.



DISTRIBUTORS FOR PRATT & WHITNEY AIRCRAFT

Airwork
CORPORATION
MILLVILLE, NEW JERSEY

NEW YORK

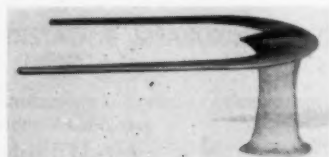
MIAMI

WASHINGTON

Beacons, Isolation Amplifiers & Jack Boxes

Engineering Data

Unit Name	Model	Manufacturer	General Purpose	Weight	Dimensions Length-Width-Height	Range	Channels
Marker beacon receiver	51Z-1	Collins	ILS		$\frac{1}{2}$ ATR (12 9/16" long)	75 mc.	1
Receiver	MD-60	Aviation Accessories	Marker beacon receiver	14 1/2 lbs.	15 3/4" x 5" x 7 1/2"	75 mc.	"
Receiver	MB-61	"	"	15 1/2 lbs.	19" x 5" x 7 1/2"	75 mc.	"
Receiver	MB-62	"	"	14 1/2 lbs.	15 3/4" x 5" x 7 1/2"	75 mc.	"
Receiver	MB-63	"	"	15 1/2 lbs.	19" x 5" x 7 1/2"	75 mc.	"
Receiver	R-20	Aircraft Radio Corp.	"	2.6 lbs.	6 11/16" x 4 15/16" x 5 3/4"	75 mc.	"



● VHF NAVIGATION ANTENNA

Manufacturer: Bendix Radio, Div. of Bendix Aviation Corp.

Model: MS-192

Weight: 5 lbs., 12 oz.

Dimensions: 12.06" high x 25.75" long x 17.19" wide.

General: Designed for reception of VHF navigation and runway localizer signals, the MS-192 antenna is horizontally polarized. It provides broad-band, non-directional performance, while incorporating aerodynamic design which minimizes drag. (36*)

● MARKER BEACON RECEIVER

Manufacturer: Bendix Radio, Div. of Bendix Aviation

Model: MN 53B

Weight: 11.66 lbs.

Dimensions: 18.5" x 9.0" x 5.0"

General: Tuned at 75 mc., providing aural and visual indication of marker beacons. (38*)



● ISOLATION AMPLIFIER

Manufacturer: Aircraft Radio Corp.

Model: F-11A

Weight: 9 lbs.

Dimensions: 11 3/8" x 4 15/16" x 5 3/4"

General: Permits each pilot to have independent selection of up to 10 audio input channels in any combination without cross-cockpit interference. (39*)

● ISOLATION AMPLIFIER JACK BOX

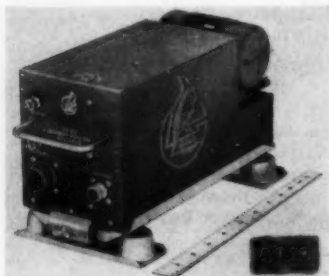
Manufacturer: Bendix Radio, Div. of Bendix Aviation Corp.

Model: MS-92

Weight: 4.5 lbs.

Dimensions: 8.62" x 3.68" x 6.5"

General: Provides nine reception and three transmission channels, plus interphone. (40*)



● MARKER BEACON RECEIVER

Manufacturer: Lear, Inc.

Model: L-2200

Weight: 10 lbs.

Dimensions: 4 13/16" x 5 3/4" x 11 13/16"

General: Tuned at 75 mc., providing aural and visual indication of marker beacons. (37*)



Looking For More Information?

Then see pages 5 and 6.

Isolation Amplifier Data

Unit Name	Mfr.	Model	Weight	Dimensions
Isolation and interphone amplifier	Bendix Radio	MI-32A	10.12 lbs.	19.56" x 4.87" x 7.71"

What JACK & HEINTZ is doing about...

HEAT RESISTANCE

Extreme jet engine heats give a "hot foot" to electrical components. Ordinarily, insulation must be heavy—bulky. To meet the ever-increasing need for compactness, J&H developed a new paper-thin plastic insulation. Coated with this heat-resistant skin, compact electrical components can withstand temperatures as high as 500° F.

This is just another example of how Jack & Heintz solves unusual and difficult problems . . . even when that means originating new materials. If you need this kind of unique engineering skill in solving your electrical, hydraulic or mechanical problems—Jack & Heintz is the place to come. For technical information and examples of J&H solutions to heat-resistance problems, write Jack & Heintz, Inc., Dept. 1001, Cleveland 1, Ohio.



JACK & HEINTZ
Rotomotive
EQUIPMENT

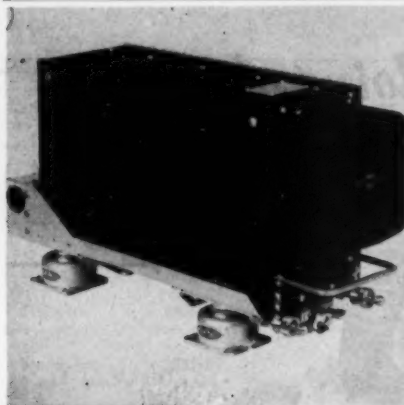


© 1952, Jack & Heintz, Inc.

means electrical, hydraulic or mechanical devices designed to solve unusual problems of developing, controlling or using power

Generating Equipment — a-c and d-c—including Control Systems and Components • Electric Starters • Actuators and Special Aircraft Motors • Custom-built Commercial Motors • J&H Eisemann Magnets

Computers



● STEERING COMPUTER

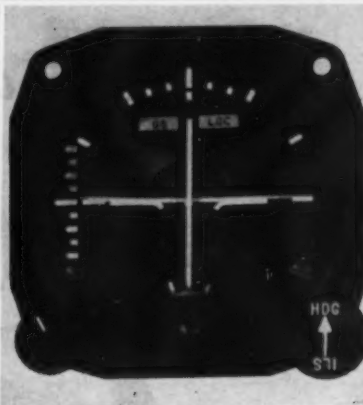
Manufacturer: Collins Radio Co.

Model: 562A-1

Weight: 11.5 lbs.

Dimensions: ½ ATR

General: The steering pointer on the approach horizon is fed information from the steering computer which gathers its data from the localizer receiver, compass and vertical gyro, making instant by instant calculations. The computer also automatically corrects crosswind effect between the outer marker and the runway, relieving the pilot of that chore while in final approach. Although a feature of the integrated flight system, it cannot be used on omni but is effective in flying compass headings. (41*)



● APPROACH HORIZON

Manufacturer: Collins Radio Co.

Model: 329B-1

Weight: 2.5 lbs.

Dimensions: 3" instrument

General: Recording plane altitude and providing steering information are the dual functions of the approach horizon which is used in conjunction with the course indicator in Collins integrated flight system. It provides the necessary information needed for completing final approach on an ILS course. When the "GS" or "LOC" flags are not in view, ILS and VOR receivers are operating properly.



● COURSE INDICATOR

Manufacturer: Collins Radio Co.

Model: 331A-1

Weight: 7.5 lbs.

Dimensions: 5" instrument

General: One of two basic instruments of Collins integrated flight system which is adaptable to flying the omnirange, the course indicator is composed of a compass card upon which have been superimposed markers which duplicate the aircraft's heading and displacement along either the ILS or VOR course. The course knob is used to select the localizer or omnirange course and the heading knob is used to adjust the heading marker. By just flying the small "airplane" toward the course line bar, a course may be intersected due to the sensitivity of the instrument. (44*)



● ZERO READER FLIGHT DIRECTOR

Manufacturer: Sperry Gyroscope Corp.

Model: Z-1 and Z-2

Dimensions: Indicator: 5-5/8" x 3 1/4" x 3 1/4"

General: Sperry's zero reader provides a supplementary single reading for five instruments including the directional gyro, attitude gyro, air speed indicator, altimeter, and turn & bank



indicator on approaches. After setting the selector switch for the desired maneuver, the zero reader receives its signal from the localizer or omnirange receiver. Needle centers when the desired track is used. The heading selector is used as an auxiliary unit in any flight attitude. When set to any desired compass heading it connects with the vertical needle to provide data on the plane's position relative to the setting. (43*)

*For more information, see pages 5 and 6.



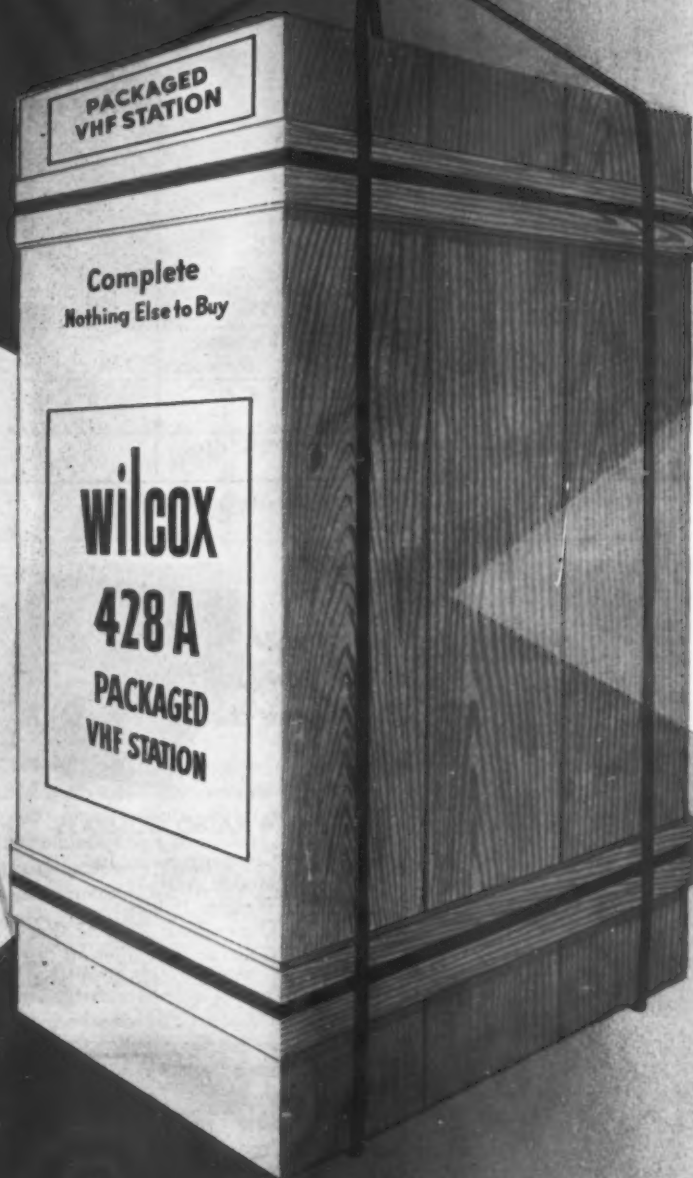
● RADIAL CONVERTER INDICATOR

Manufacturer: Eclipse-Pioneer, Division of Bendix Aviation Corp.

Model: 7202, 7203

Weight: 21 lbs. 15 oz.; 21 lbs. 8 oz.

General: A servo follow-up enables radial converter indicator to show VOR station automatically, working independently of the radial selector and course deviation indicator. (45*)



wilcox
 ELECTRIC COMPANY, INC.
 Fort Worth and Chicago
 Radio City Station, Dallas, U.S.A.

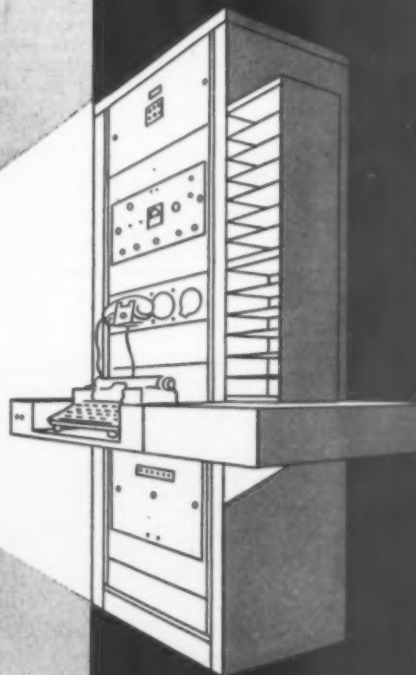
Low initial cost

Dependable—
 large component
 safety factor

50 watt
 VHF transmitter,
 Type 408A

Highly selective
 and sensitive receiver,
 Type 305A

Rapid installation—
 easily moved



One antenna
 for transmitter and
 receiver

Spurious responses
 at least 100 db down

Frequency range
 118-132 mc/s

All controls
 within easy reach

Easy maintenance

Write today for
 complete specifications

Radio Compasses

Engineering Data

Unit Name	Model	Manufacturer	General Purpose	Weight	Dimensions Length-Width-Height	Range	Channels
Compass receiver	Cert. R-5/ARN-7	Aviation Accessories	Automatic direction finder	50 lbs.	20-1/16" x 12" x 8 3/4"	100-1750kc.	
Radio compass	MN-26()	Bendix Radio	"	37.37 lbs.	17.56" x 12.0" x 7.87"	Rec.Sens 6mv Loop sens 120mv	Tunable
Radio compass	ADF-12	Lear, Inc.	"	16.1 lbs.	8 3/4" x 6 3/4" x 2 3/4"	200- 440kc. 475-1050kc. 1000-1750kc.	Tunable
Compass indicator	ADF-50	Aviation Accessories	Dual azimuth	30 oz.	6 1/4" 5 7/8" dia.		
"	ADF-51	"	Single azimuth	1.9 lbs.	6" 5 7/8" dia.		
"	ADF-52	"	Single azimuth	1.75 lbs.	3 3/4" 3" dia.		
"	ADF-53	"	Dual azimuth	30 oz.	6 1/4" 5 7/8" dia.		



RADIO COMPASS RECEIVER

Company: Radio Corp. of America
Model: AVR-22
Weight: 53 lbs. complete

Dimensions: 1/2 ATR

General: Operates from 12 to 24 volts over 150 to 1,750 kc. Azimuth indicators available in 3" or 5" sizes. (46*)

* For more information see pages 5 and 6.



● RADIO COMPASS

Company: Lear, Inc.
Model: ADF-14
Weight: 16.1 lbs.
Dimensions: 7" x 3 3/4" x 7 1/4"
General: Reception on three bands: 200-440 kc., 475-1050 kc., and 1000 to 1750 kc. (47*)



● RADIO COMPASS

Company: Aviation Accessories Inc.

Model: R5/ARN-7
Weight: 48.13 lbs.
Dimensions: Full ATR

General: Frequency range 100 to 1750 kc. in four bands. 110 volts a-c and 28 volts d-c power requirements. (48*)



RADIO COMPASS RECEIVER

Company: Bendix Radio Div., Bendix Aviation Corp.

Model: MN-62A

Weight: 54 lbs.

Dimensions: 20.31" x 12" x 7.5"

General: Receiver sensitivity 2.5-5.0 mv; loop sensitivity 28-100 mv. Tunable. Direction finding 100-1750 kc. (49*)

* For more information see pages 5 and 6.

Among the Catalogs

CAPACITORS: Electro-Cap, Inc., has detailed the uses and types of capacitors in a loose-leaf catalog, including details on hermetically-sealed and miniature capacitors. Price lists and complete range of sizes are included.

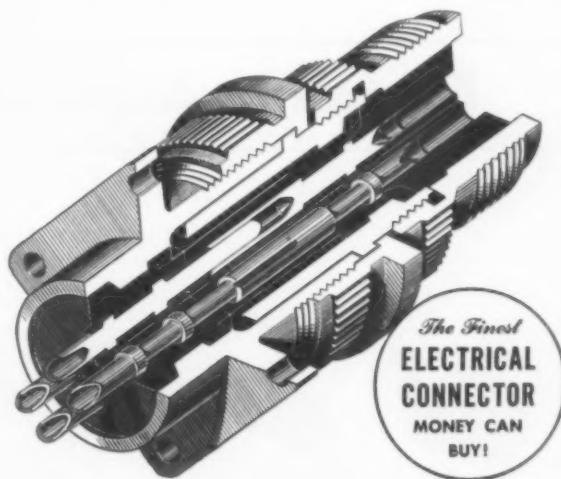
MARKERS: W. H. Brady Company makes a complete line of markers, and industrial and safety identification tapes. A series of bulletin sheets outline the various types, sizes, properties, and prices.

SILICONES: A group of brochures put out by Dow Corning Corporation describe uses and properties of Silicones. Titles are "What's a Silicone?"; Dow Corning Silicone Notebook covering 200 fluids, and DC-4 Silicone compound.

INSULATION ACCESSORIES: Varglas Corporation has prepared a packet which contains actual samples of Varglas silicone products, Varglas Permafil tubing and sleeving, Syntholvar extruded tubing, cotton tubings and sleeveings. Average voltage and dielectric strength are outlined for each product.

SCINFLEX ASSURES YOU PEAK PROTECTION AGAINST CIRCUIT FAILURE

When operating conditions demand an electrical connector that will stand up under the most rugged requirements, always choose Bendix Scinflex Electrical Connectors. The insert material, an exclusive Bendix development, is one of our contributions to the electrical connector industry. The dielectric strength remains well above requirements within the temperature range of -67°F to $+275^{\circ}\text{F}$. It makes possible a design increasing resistance to flashover and creepage. It withstands maximum conditions of current and voltage without breakdown. But that is only part of the story. It's also the reason why they are vibration-proof and moisture-proof. So, naturally, it pays to specify Bendix Scinflex Connectors and get this extra protection. Our sales department will be glad to furnish complete information on request.



BENDIX SCINFLEX ELECTRICAL CONNECTORS

Bendix

SCINTILLA MAGNETO DIVISION of
SIDNEY, NEW YORK



Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, N. Y.

FACTORY BRANCH OFFICES: 118 E. Providence Ave., Burbank, Calif. • Stephenson Bldg., 6560 Cass Ave., Detroit 2, Michigan • Brauer Bldg., 176 W. Wisconsin Avenue, Milwaukee, Wisconsin • 582 Market Street, San Francisco 4, California

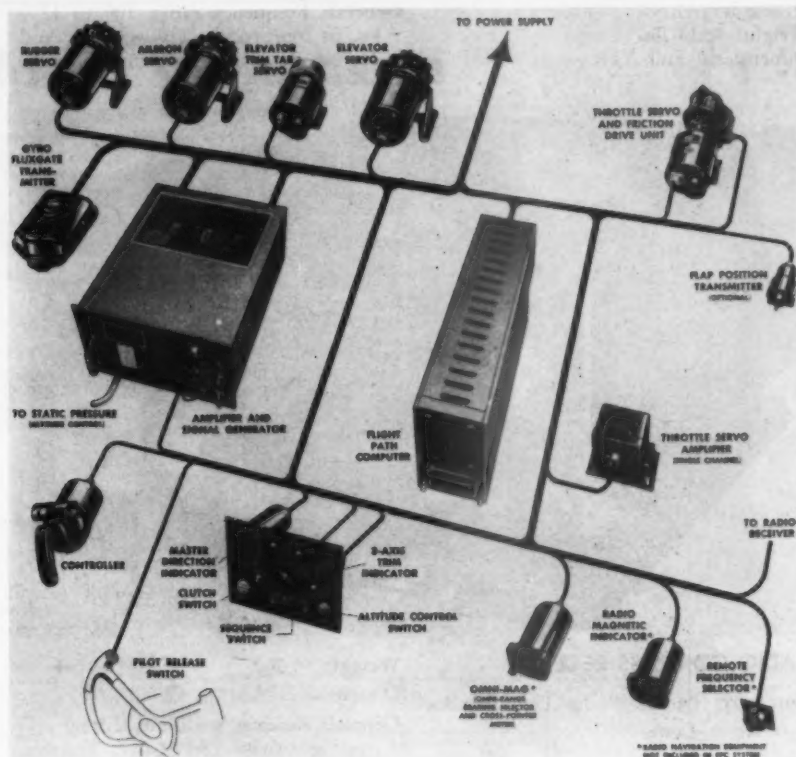
• Moisture-Proof • Radio Quiet • Single Piece Inserts • Vibration-Proof • Light Weight • High Insulation Resistance • High Resistance to Fuels and Oils • Fungus Resistant • Easy Assembly and Disassembly • Fewer Parts than any other Connector • No additional solder required.

● AUTOPILOT SYSTEM

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: PB10A

General: An electronic autopilot system using 115-volt, 400-cycle, 3-phase alternating current and 28 volt d-c, providing automatic synchronization, altitude, trim tab, and power control. Includes automatic approach and range flying components. (50*)



Electronic Autopilots



● AUTOPILOT SYSTEM

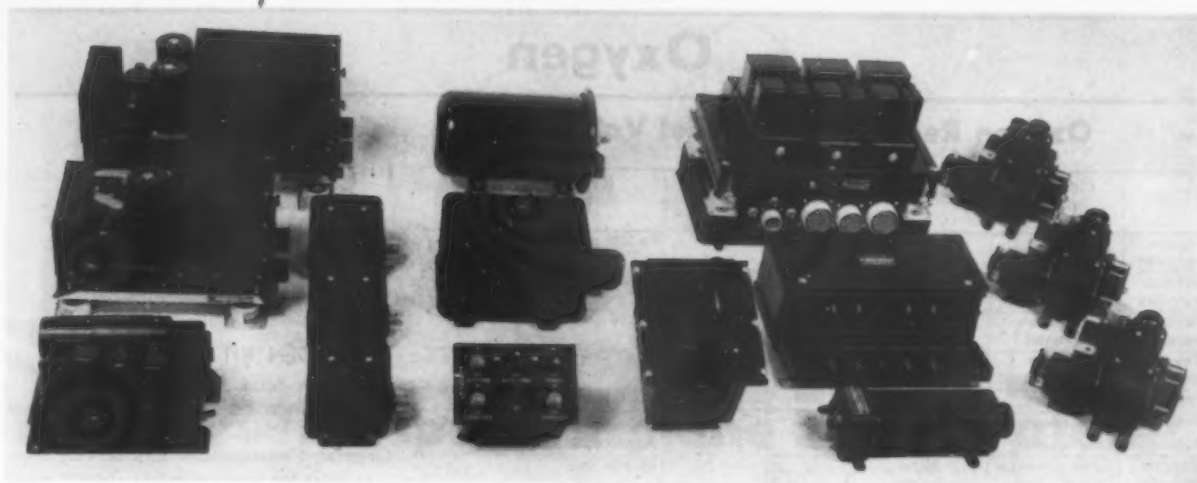
Manufacturer: Sperry Gyroscope Company

Model: A-12 Gyropilot

Weight: Average 180 lbs.

General: An electronic autopilot system using 115-volt, 400-cycle, single-phase alternating current and 28 volt d-c, the A-12 system features gyro compass trim control, altitude control, automatic approach control, a highly responsive servo system, and a coordinated turn control. (51*)

* For more information see pages 5 and 6.



● AUTOPILOT SYSTEM

Manufacturer: Lear, Inc.

Model: L-5

Weight: Approx. 55 lbs.

General: An electronic autopilot system using 115-volt, 400-cycle, 3-phase alternating current and 27.5 volt d-c, the L-5 system is the commercial counterpart of the military F-5 system used in jet fighter aircraft. Includes automatic altitude control and automatic approach control. (52*)



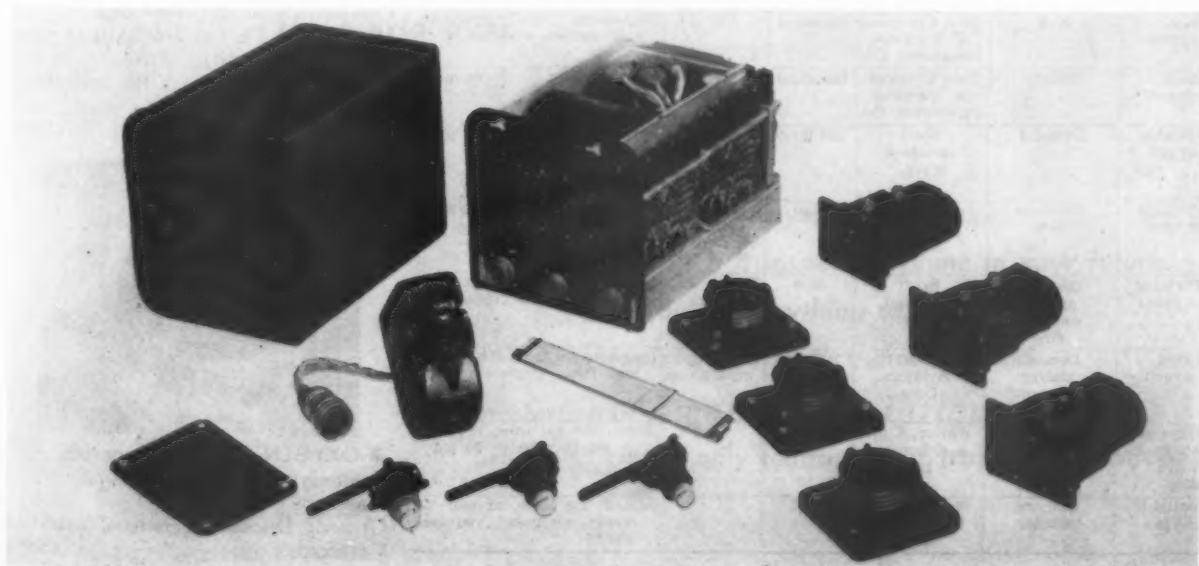
* For more information see pages 5 and 6.

● AUTOPILOT SYSTEM

Manufacturer: Minneapolis-Honeywell Reg. Co.

Model: E-11

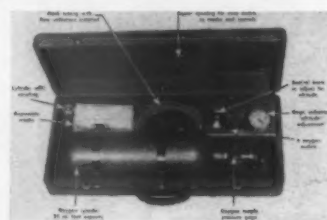
General: Components of the E-11 autopilot system with available weights include (from rear forward and left to right) localizer unit (12 lbs.), glide slope unit (7.3 lbs.) and compass coupler (4.0 lbs.), all with mounts; roll, pitch and yaw gyros, second row; altitude controller (8 lbs.), cageable vertical gyro and function selector, third row. The flight controller is shown by itself alongside the three single-channel amplifiers (2 lbs. each) and relay unit in the single large package, the calibrator and the airspeed compensator (2 lbs.). On the extreme right are the elevator, rudder, aileron servos weighing 6.8 pounds each. (53*)



Oxygen

Oxygen Regulators & Relief Valves

Unit	General Type	Manufacturer	Model	Weight	Regulating Range
Oxygen regulator	Cont. flow	Alar Prod. Inc.	AN6010-1A	11 oz.	50-500 psi
Oxygen regulator	Cont. flow	Alar Prod. Inc.	A-2000	11 oz.	50-2,000 psi
Oxygen regulator	Diluter demand	Alar Prod. Inc.	A-14		50-500 psi
Oxygen regulator	Diluter demand	Alar Prod. Inc.	A-12A		
Regulator	Oxygen	Puritan	1069	3#	Set pressure 55 psi
Regulator	Oxygen	Puritan	1113	3#	Adjustable manifold type
Regulator	Oxygen	Puritan	1099	3#	Adjustable max. 30 psi
Oxygen regulator	Low pressure single stage	Mine Safety Appliance			25-150 psi
Oxygen regulator	High pressure two stage	Mine Safety Appliance			50-1800 psi
Oxygen pressure reducing regulator	Adjustable output	Scott Aviation Corp.	8550A	1#	Used in fixed system. Can handle flow for 50 persons at 30,000 ft.
Oxygen demand regulator	Fixed	Scott Aviation Corp.	6380-01		Conserves oxygen. Permits use of full mask for smoke and fume protection.
Press. regulator		Air Assoc.	HC-7300	.75#	800 to 3,200 psi
Relief valve		Air Assoc.			100 to 3,700 psi



● OXYGEN KIT

Company: Scott Aviation Corp.

Model: 87 Aviox

Weight: 29 lbs.

General: Constant-flow unit serving four persons for supplementary oxygen uses. (54*)

● OXYGEN REGULATOR (Diluter Demand)

Company: Fluid Power, Inc.

Model: 1550 (USAF A-14) (Mil 6371)

1600 (USAF A-12-A) (Mil 403 70-A) (55*)

● OXYGEN REGULATOR (Multi-stage)

Company: Puritan Compressed Gas
Model: 1070

Weight: 3.5 lbs.

General: Reduces high tank pressure to desired operating pressure for single or multiple outlets. Includes tank pressure gauge. (56*)

● OXYGEN MASK

Company: Puritan Compressed Gas
Model: 1138

Weight: 2.75 oz.

General: Rebreather type—offers minimum of interference for conversation. (57*)

● OXYGEN (SMOKE) MASK

Company: Scott Aviation Corp.

Model: 6200 FL (with 6000-B1-O portable oxygen unit)

General: Demand mask for emergency use as protection against smoke and fumes. (80*)



● OXYGEN MASK (Disposable)

Company: Scott Aviation Corp.

Model: 8600

General: Disposable oro-nasal mask of rebreather type. (58*)

Oxygen Masks, Bottles & Related Equipment

Mask, oxygen	B-L-B (Nasal)	Ohio Chemical & Surgical Equipment Co.	Standard	6.0 oz.	For constant flow oxygen systems
Mask, oxygen	B-L-B (Oronasal)	Ohio Chemical & Surgical Equipment Co.	Standard	6.5 oz.	For constant flow oxygen systems
Mask, oxygen	A-B8	Ohio Chemical & Surgical Equipment Co.	Standard	7.5 oz.	For constant flow oxygen systems
Mask, oxygen	A-14A	Ohio Chemical & Surgical Equipment Co.	Standard	11.5 oz.	For demand flow oxygen systems
Mask, oxygen	K-S	Ohio Chemical & Surgical Equipment Co.	Standard	0.3 oz.	Disposable; for constant flow oxygen systems
Mask, oxygen	Infant	Ohio Chemical & Surgical Equipment Co.	Standard	3.0 oz.	For constant flow oxygen systems
Portable oxygen	Demand	Scott Aviation Corp.	600-B1-0		For smoke and fume protection
Portable oxygen	Constant flow	Scott Aviation Corp.	5500	Varies with cylinder size	For supplementary oxygen Serves two persons
Portable oxygen	Demand and/or constant flow	Scott Aviation Corp.	5600	Varies with cylinder size	For supplementary oxygen or smoke and fume protection
Fixed oxygen	Demand and/or constant flow	Scott Aviation Corp.	8500	Varies with installation	Can also be used for smoke and fume protection
Oxygen bottle & valve assy.	High pressure	Walter Kidde & Company, Inc.	87046	1.3#	With 3000 psi inlet regulate to 300 to 2000 \pm 50 psi
Portable oxygen	Demand diluter	Walter Kidde & Company, Inc.	A-1		Mixed air and oxygen to meet altitude requirements

* For more information see pages 5 and 6.

There's A Transport Airplane in Your Future!



The world's **4100** airline planes
+ **8000** corporate aircraft
+ **2050** military transports
add up to **14,150** transport planes

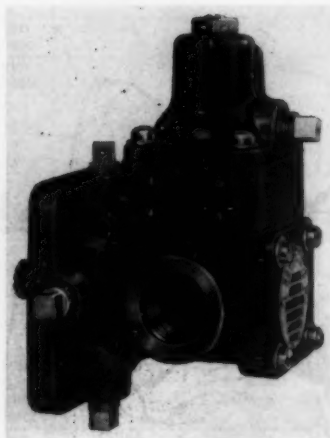
The men who design them,
buy them,
fly them,
maintain them—
and their ground aids and equipment—
the world over
read **American Aviation**

If you're in aviation,
there's a transport airplane in your future.
If you sell anything to aviation,
look to your future markets and
advertise in **American Aviation**
—the only magazine of transport aviation.





ACCESSORIES



● FUEL PUMP

Manufacturer: Lear, Inc.

Model: RG-9080

Weight: 1.94 lbs.

Dimensions: 3 3/4" x 2 3/4" x 4 3/4"

Output: 100 gph at 2 1/2 to 20 psi

General: Typical Romec Pump as used in Cessna L-19 and Aero Commander. (59*)



● FUEL FLOWMETER TRANSMITTER

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 9100

Weight: 3.5 lbs.

Dimensions: 4" x 6" x 5 7/8"

General: Operating on 26-volt, 400-cycle, single-phase current, the 9100 is an Autosyn transmitter for gauging fuel flow from 100 to 1,000 and up to 1,000-20,000 lbs./hr. Mating indicator required. (60*)



● FUEL PUMP

Manufacturer: Lear, Inc.

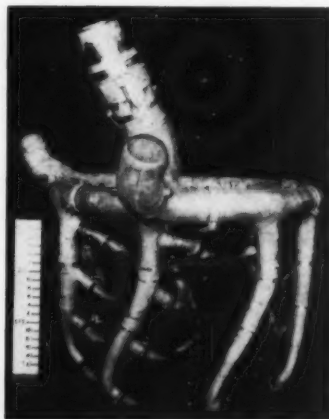
Model: RD-7790

Weight: 0.88 lbs.

Dimensions: 2 7/16" x 2 7/16" x 2 7/16"

Output: 15 gph at 13-15 psi at 3,700 rpm

General: Typical Romec Pump as used in Beech Bonanza and Ryan Navion. Has 12-tooth spline drive. (61*)



● EXHAUST SYSTEM

Manufacturer: Ryan Aeronautical Co.

General: Exhaust system of Boeing 377 shown. Similar systems of lightweight stainless steel fabrication featuring long life at extremely high temperatures are designed and built by Ryan for aircraft engine installations ranging from North American AT-6 to Douglas C-124. (62*)

* For more information see pages 5 and 6.



● OIL TANK

Manufacturer: United Aircraft Products, Inc.

Model: U-512120

Capacity: 5 gallons

General: A typical aluminum or stainless steel oil tank such as used for Wright J-65 jet engine installations. (63*)



● STARTER

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 36E07

Weight: 26.75 lbs.

General: Operating on 24 volts d-c, the model 36E07 rotates clockwise, providing starting power for Pratt & Whitney R-4360 engines. Uses 3-tooth jaw and 3-to-1 starter drive to crankshaft ratio. (64*)



● STARTER

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 756

Bendix Products Division

FIRST IN

FUEL METERING



Planning for the Future— Building for the Present

Bendix Products' position of leadership in fuel metering and landing gear has been attained through its' unique ability to plan as well as to produce.

The specialized knowledge of trained engineers and the vast research facilities of Bendix are constantly employed in the development of new and better products.

Assembled here, also, is the most modern and comprehensive machinery in the industry to assure production in quantity and precision in quality to meet your most exacting demands.

Whether your problem is planning or producing fuel metering, carburetion, struts, brakes or wheels, you will find Bendix Products is best qualified to do the job.

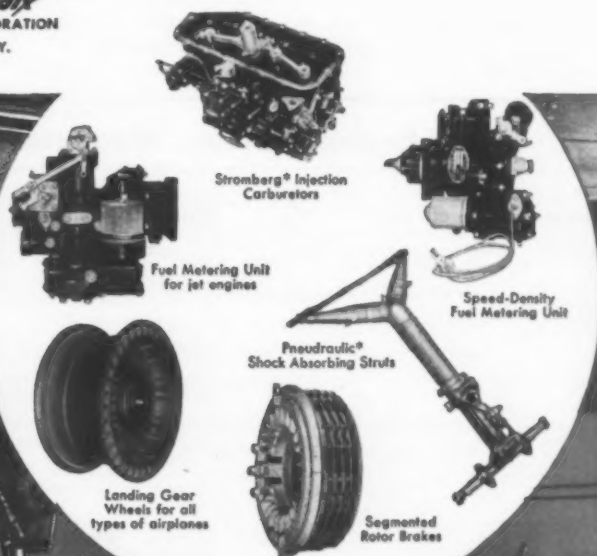
BENDIX · PRODUCTS DIVISION · SOUTH BEND



Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, N. Y.

LEADER IN

LANDING GEAR



*REG. U. S. PAT. OFF

Starters

Unit Name	Mfr.	Model	Weight	Power Req.	Output	Dimensions	Example of Exist. Inst.	Type Drive
Gas turbine Jack & Heintz starter		D27	44 lbs.	O-30 v. d-c 1,000 amp.	61 lb.-ft. @ 1,700 rpm	6 7/8" x 13"	J-34 turbojet engine	AND20004 Type XIV
Cranking motor	Delco Remy	1109651	16 lbs.	12 v.		3 7/8" x 12 3/4"	Aircooled motors	Bendix
"	"	1109656	15 lbs.	12 v.		3 1/2" x 8 9/64"	Continental motors	Clutch
"	"	1109652	15 lbs.	12 v.		3 1/2" x 8 33/64"	Lycoming	None
"	"	1109665	15 lbs.	24 v.		3 1/2" x 8 33/64"	Lycoming	None
Starter	Eclipse Pioneer	36E03	27 lbs.	12 v. d-c			For engines up to 1,830 cu. in. displacement	3-tooth jaw; clock & c'clock rotation
"	"	1416	27-31 1/2 lbs.	24 v. d-c			For engines up to 3,500 cu. in. displacement with 1:1 starter drive-to-c/shaft ratio	3-tooth jaw; clock & c'clock rotation
"	"	15E48	25 1/2 lbs.	200/115 v. 3 ph. 400 cps			For P&W R-4380 engine with 3:1 starter drive-to-c/shaft ratio	3-tooth jaw; clock rotation; jaw on armature shaft for driving scavenging unit
"	"	36E00	27 lbs.	24 v. d-c			For engines up to 3,500 cu. in. displacement with 1:1 starter drive-to-c/shaft ratio	3- and 12-tooth jaws; clock rotation
"	Jack & Heintz	D29-1	28.25 lbs.	200 v. a-c 400 cyc. 3 ph.	185 lb.-ft. @ 150 rpm	6" x 12 1/2"	For engines ranging from 2,650 to 4,500 cu. in. displacement	AND20004 Type XIV B
"	Eclipse Pioneer	36E23					Combustion starter for Wright Sapphire engine	

Weight: 18 lbs., 4 oz.

General: Designed for engines up to 985 cu. in. displacement and having a 1-1 starter drive-to-crankshaft ratio, the 756 operates on 24 volts d-c and features a 3-tooth jaw and 6-inch mating flange.

● OIL COOLER

Manufacturer: United Aircraft Products, Inc.

Model: U-7800-1

Weight: 18 1/2 lbs. (aluminum)

Dimensions: 16" x 16" x 3" approx.

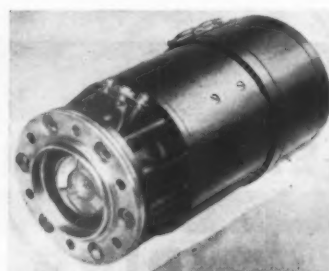
General: A typical UAP liquid-to-liquid

cooler such as used on G-E J73-3 jet engines. High strength and high efficiency eliminate need for surge protection. (66*)

Engine Driven Magnets

Unit Name	Manufacturer	Model	Weight	Output	Example of Exist. Inst.
Magneto	Bendix Scintilla	D4RN-2	12 3/4 lbs.	High tension	P&W R-4360 engines
"	"	SF14RN-15	11 1/2 lbs.	Low tension	P&W R-4360 engines
"	"	DF18LN-1	25 lbs.	High tension	Wright R-3350 engines
"	"	DLN-9	26 lbs.	Low tension	Wright R-3350 engines
"	"	DF18LN	23 lbs.	High tension	P&W R-2800 engines
"	"	D9LN-2	20 lbs.	Low tension	Wright R-1820-82W engines
"	"	S4 & S6	5 lbs. approx.	High tension	Light aircraft engines
"	"	DLN-10	18 1/2 lbs.	Low tension	P&W R-2800 engines

* For more information see pages 5 and 6.



● GAS TURBINE STARTER

Manufacturer: Jack & Heintz

Model: D31-1

Weight: 46 lbs.

Dimensions: 6 7/16" dia. x 13 13/16"

Output: 135 lb.-ft. at 800 rpm.

General: For starting turbojet engines such as Allison J-33 and Pratt & Whitney J-42 and J-48 engines, the D31-1 requires up to 30 volts d-c and 1,000 amperes. (67*)



Legs for Aerial "Workhorses"

For military airlift operations, carrying men, guns or materiel, Fairchild C-119 "Flying Boxcars" are outstanding transport planes.

AEROL shock absorbing landing gear contribute greatly to their battle-proved dependability. Cleveland Pneumatic AEROLS enable plane and cargo to land smoothly and safely even on difficult terrain.

First producing AEROLS in 1926, Cleveland Pneumatic pioneered and perfected this modern air-oil strut that is so widely used in all types of aircraft. In landing gear, Cleveland Pneumatic is known throughout the aviation industry as *first in the field!*

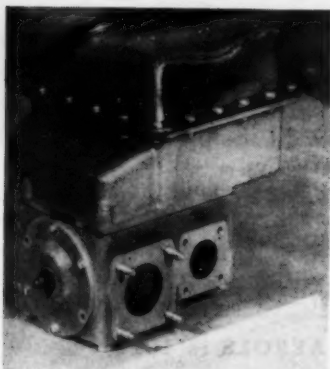
The Cleveland Pneumatic Tool Company, Cleveland 5, Ohio... Established 1894.

CLEVELAND PNEUMATIC

First in the Field! Aircraft Landing Gear • Ball Bearing Screws • Actuators

Generators

Unit Name	Mfr.	Model	Weight	Power Req.	Output	Dimensions	Example of Exist. Inst.	Type Drive	Remarks
Generator	Jack & Heintz	G29-8	69 lbs.	Engine-driven	12 kw	8" dia. 13 1/8" long	Lockheed F94 AND20006		
"	Delco Remy	1101877	12 lbs.	12 v.	26 amps.	4 3/8" dia. 9 1/2" long	Aircooled motors		
"	"	1101890	11 lbs.	12 v.	20 amps.	4 3/8" dia. 8" long	Continental Motors		
"	"	1101879	11 1/2 lbs.	12 v.	26 amps.	4 3/8" dia. 9 3/8" long	"		
"	"	1101887	11 1/2 lbs.	12 v.	35 amps.	4 3/8" dia. 9-33/64" long	"		
"	"	1101882	12 lbs.	12 v.	26 amps.	4 3/8" dia. 7 5/8" long	Lycoming		
"	"	1101884	12 1/2 lbs.	24 v.	15 amps.	4 3/8" dia. 9-15/64" long	"		
"	"	1101889	12 lbs.	24 v.	15 amps.	4 3/8" dia. 9-15/64" long	"		
"	Eclipse Pioneer	1097	48.5 lbs.		d-c 30 v. 200 amps. a-c 115 v. 800 cps, 1 ph			Engine driven	
"	"	1632	6 lbs.		a-c 27 v. 400 cps, 3 ph			Engine driven	Standby for gyro flight instruments.
"	"	1633	50 lbs.		a-c 120/280 v. 27.7 amps.		Navy type NEA-10	C'clock rotation; engine driven.	
Inverter	"	1518	35.5 lbs.		115 v. 2000 va, 400 cps, 3 ph 115 v. 1500 va, 400 cps, 1 ph				Single and three-phase loads may be carried simultaneously under certain load conditions.
"	"	32EO5			115 v. 5000 va, 400 cps, 1 ph				
"	"	12142	13 lbs.		115 v. 250 va, 400 cps, 3 ph				



● OIL DIVERTER—SEGREGATOR VALVE

Manufacturer: United Aircraft Products, Inc.

Model: U-5410-2

General: Of aluminum construction, diverter-segregator system allows warm-up of engine without additional heat from external sources. Used on Piasecki H-21A helicopter. (68*)

● VACUUM PUMP

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 33E02

Weight: 11 lbs.

Rating: 30 cfm at 2,250 rpm, suction ranging from 6"—16" Hg.

General: An engine-driven vacuum pump for use in instrument and pneumatic deicer systems. (69*)



● STARTER

Manufacturer: Jack & Heintz

Model: JH6

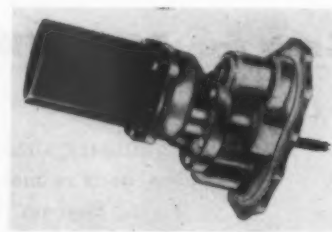
Weight: 26.5 lbs.

Dimensions: 6" dia. x 12"

* For more information see pages 5 and 6.

Output: 400 ft.-lbs. at 25 rpm and 13.5 volts.

General: Model JH6 starter is for piston engines with displacement ranging from 1,000 to 4,500 cu. in. Operates on 24 volt d-c current. (70*)



● WATER INJECTION PUMP

Manufacturer: Lear Inc.

Model: RG-8825

Weight: 8.5 lbs.

Dimensions: 4 7/8" x 9 3/32"

Power Requirements: 1/5 hp

Output: 200 gpm at 24 psi.

General: A fully submerged water injection pump operating on 27 volts used in Convair 340 and Fairchild C119B. (71*)

Here's where a pair BEATS three of a kind



The New Intermediate Device
for the

PACITRON

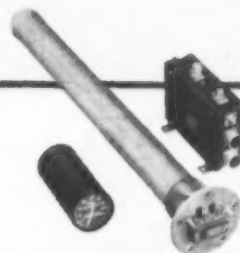
Fuel Gage System

Only two electronic tubes are required in the new combined amplifier-bridge unit of the Pacitron fuel gage—in place of the three commonly used. And fewer tubes mean greater reliability.

Lightest and most compact unit of its type now available, the amplifier-bridge will readily meet the most difficult installation requirements.

This adaptability results from the unique internal shock mounts which allow for inverted mounting, if desired, favorable aspect ratio, and provision for rack or bracket mounting. It is designed to meet or exceed the requirements of MIL-G-7817 and MIL-G-7818.

Write, Wire, or Phone for Details



PACITRON ELECTRONIC FUEL GAGE CLIMAXES 10 YEARS OF DEVELOPMENT

Simmonds first introduced the highly accurate capacitance-type fuel gage to the U.S. aviation industry. In 10 years of development, consistent refinements have cut weight, simplified installation and increased ruggedness. Today more than 40 types of advanced U.S. commercial and military aircraft are flying with Simmonds Gages—a tribute to the Simmonds reputation as "first in electronic fuel gaging."



Simmonds

AEROCESSORIES, INC.

Tarrytown, New York

Manufacturing Plants: Vergennes, Vermont • Danbury, Connecticut — Branch Offices: Glendale, Cal. • Dayton, Ohio • Dallas, Texas • Washington, D.C. • Montreal, Canada

OCTOBER 27, 1952

49

Engine & Ignition Analyzers



Bendix Scintilla Ignition Analyzer

● IGNITION ANALYZER

Manufacturer: Scintilla Magneto Div.,
Bendix Aviation Corp.

Model: 11-3350

Weight: 25 lbs.

Dimensions: 7" x 10" x 19"

General: An ignition analyzer adaptable for portable, portable-airborne, or airborne use. Includes ignition voltage control. (72*)



● AIRBORNE ENGINE ANALYZER

Manufacturer: Sperry Gyroscope Co., Inc.

Model: D-5

Weight: 93 lbs., complete

General: Airborne analyzer for complete ignition and vibration analysis. Designed for four-engine aircraft. (73*)

WORLD'S PREMIER AIRPLANE FABRIC

lighter

stronger

smoother

FLIGHTEX

FLIGHTEX FABRICS, Inc. • 93 WORTH STREET • NEW YORK 13, N.Y.

Leading Manufacturers of
Fabric and Tapes for the
Aircraft Industry.

FLIGHTEX FABRIC

Export Representative
AVIQUIPO, Inc.
25 Beaver Street, N. Y.
Cable: AviQUIPO

LANDPLANE

FLOATPLANE

SKIPLANE



THE DE HAVILLAND

Beaver

ECONOMY PLUS PERFORMANCE

1400 lb. payload at 500 miles range. A top speed of 160 M.P.H. plus the ability to get in and out of small fields (Airborne in 550', fully loaded). As a Load carrier, Sprayer, or Duster, THE BEAVER IS WITHOUT AN EQUAL.



DE HAVILLAND PLANT, DOWNSVIEW, ONT.

THE DE HAVILLAND AIRCRAFT OF CANADA LTD.

POSTAL STATION 'L'

TORONTO, ONT.

TELEGRAM 'MOTH'



● ENGINE ANALYZER—PORTABLE

Manufacturer: Sperry Gyroscope Co., Inc.

Model: D-6A

Weight: 33 lbs.

Dimensions: 13" x 12" x 10"

General: A portable engine analyzer for use on engine test stands and in overhaul shop for both vibration and ignition testing. Uses 115-volt, 50-450 cycle a-c. (74*)



● ENGINE ANALYZER

Manufacturer: Land-Air, Inc.

Model: Portable, portable-airborne, or airborne.

Weight: 21 lbs.

Dimensions: 7 1/8" x 10 11/16" x 13"

General: A ground or airborne engine analyzer that permits viewing individual cylinder voltage wave patterns by means of engine magneto and cylinder parade selectors. (75*)



GREER STATIONARY HYDRAULIC ACCESSORIES TEST STAND for non-inflammable hydraulic fluids provides a shop-type tester to fully check hydraulic system accessories including system pump. Provides pressures to 5000 psi and flow rates to 20 gpm. Other models can be built to your specifications. *Photo courtesy United Airlines.*

Greer Manufactures Special Hydraulic Test Equipment for Non-Inflammable Fluids

Skydrol and Hollingshead, H-2, oils require specially constructed test equipment for dependability

Added safety in aircraft hydraulic design calls for non-inflammable fluids to reduce the hazard of fire. The specific nature of these new agents demands the special construction of aircraft hydraulic systems as well as the test equipment that will check their accuracy, performance and dependability.

Greer Hydraulics, pioneers in the design and manufacture of precision equipment, is the first to produce these special hydraulic test machines for leading companies like United Airlines, United Aircraft Corporation, KLM, and the United States Navy. It is further proof of Greer's

ability to keep pace with aviation progress.

Greer also manufactures a complete line of standard test machines to service all systems of all aircraft—equipment that gives the same accurate results regardless of place, conditions or operator. For out-of-ordinary requirements, a staff of creative engineers is available for discussion without obligation. A free copy of the Greer catalog is yours just for the asking. Call or write Greer today.



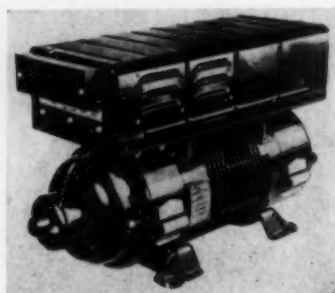
GREER PORTABLE HYDRAULIC TEST MACHINE for use with non-inflammable hydraulic fluids checks the hydraulic systems of all modern aircraft right on the flight line. Provides fluid for tests up to 3400 psi at flow rates to 20 gpm. Other models available with capacity to 75 gpm and pressures up to 5000 psi. *Photo courtesy of United Airlines.*

Greer Hydraulics Inc. • 454 Eighteenth St., Brooklyn 15, N. Y.

Field Offices: 298 Commercial Bldg., Dayton • 2832 E. Grand Blvd., Detroit • Representatives in all principal cities

Electrical Accessories

Unit Name	Mfr.	Model	Wt.	Power Req.	Output	Dimensions Dia.-Lgth.-Wdth.-Hgt.	Example of Exist. Inst.	Type Drive
Inverter	Jack & Heintz	F15-2	18.1 lbs.	28 v d-c	250 VA	—, 12 $\frac{3}{4}$, 5 $\frac{1}{2}$, 7 $\frac{1}{8}$	Republic F84	
Alternator	"	G75	39 lbs.	"	12 KVA	9, 12 $\frac{3}{4}$, —, —	Guided missile application; water vaporization cooled	AND20002 Type XII-E
Motor	"	DA17-4	63 lbs.	27 v d-c 325 amp.	9.5 hp	—, Approx. 16 $\frac{1}{16}$, 15, 13 $\frac{3}{8}$	Boeing KB29 Tanker Airplane	AND10001
"	"	DA26	1.5 lbs.	27 v d-c 2.3 amp.	.05 hp	1 $\frac{1}{8}$, 3 31/64, —, —	General purpose motor	Standard AND
Booster coil	Eclipse Pioneer Div.,	1367	1.7 lbs.	12 and 24 v				



● POWER SUPPLY REGULATOR

Manufacturer: Eclipse-Pioneer Div., Bendix Aviation Corp.
Model: 1539-8
Weight: 6 lbs. (approx.)
Dimensions: 5 9/16" x 6" x 7 11/16"
General: Designed for use with 28-volt d-c electrical systems, the model 1539 provides automatic remote control of the main line contactor (reverse current relay) and voltage regulation for the generator. (77*)



● GENERATOR

Manufacturer: Eclipse-Pioneer, Div., Bendix Aviation Corp.
Model: 30E02
Weight: 64 lbs.
Output: 30 volts 300 amps to 30 volts 400 amps
General: A blast cooled engine-driven generator with a 16-tooth spline. (79*)

● INVERTER

Manufacturer: Jack & Heintz
Model: F46
Weight: 53 lbs.
Dimensions: 17 $\frac{1}{8}$ " x 5 $\frac{1}{2}$ " x 7 7/16"
Output: 2,500 volt-amps
General: The Jack & Heintz F46 inverter operates on 28 volts d-c and is used on the Boeing B-47 and B-50. (76*)

● HEATER FUEL PUMP

Manufacturer: Lear Inc.
Model: RG-9540
Weight: 3.4 lbs.
Dimensions: 7 5/16" x 2 $\frac{3}{4}$ " x 4 1/32"
Power Requirements: 0.06 hp
Output: 35 gph at 25 psi
General: Typical pump used on Boeing C97 airplane for combustion heater fuel supply. (78*)

* For more information see pages 5 and 6.

SQUEEZE GRIP ACTION DOES IT!



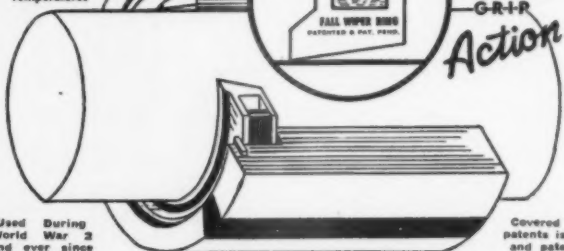
The 3-piece Fall Wiper Ring assembled into one piece as covered by patents consists of (1) a one-piece Split Wiper Ring (body) with two flanges or groove in its O.D.; (2) a one-piece split compressor spring assembled in the groove (3) an endless cover band surrounding the spring in the groove which causes a squeeze grip action on the piston rod.

The Fall Wiper Ring is available from 1/2" to 13" dia. Military part numbers from AN6231A1 to AN6231A71. Write, wire or phone us regarding your wiper needs.

Ace Products Company Toledo 1, Ohio Phone ADams 651

Fall Wiper Ring SPRING LOADED

**Keeps the Piston
ROD Clean**
In Extreme
Temperatures

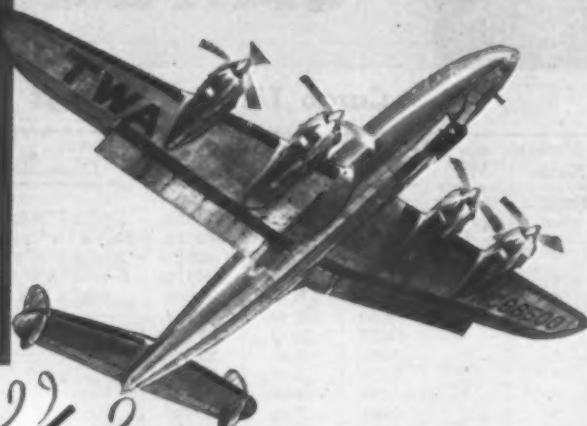


Used During
World War 2
and ever since
by the Military.

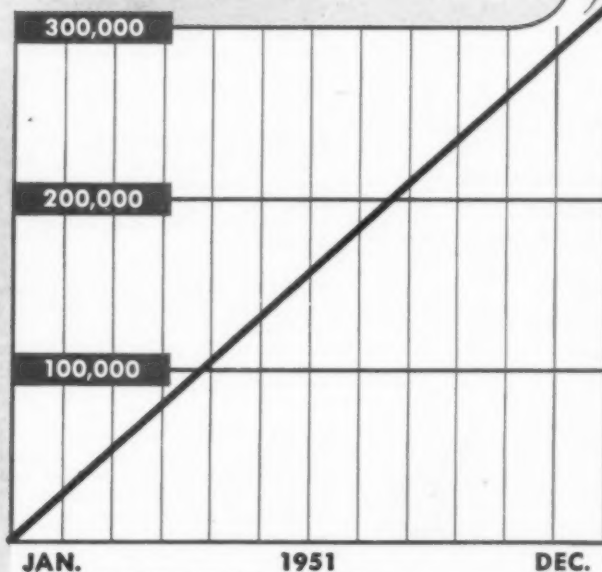
Fall Wiper Rings Spec. Mil-S-5049 are
AN Approved.

Covered by
patents issued
and patents
pend.

**304,578
PUMP HOURS
PER
MALFUNCTION**



PUMP HOURS PER MALFUNCTION

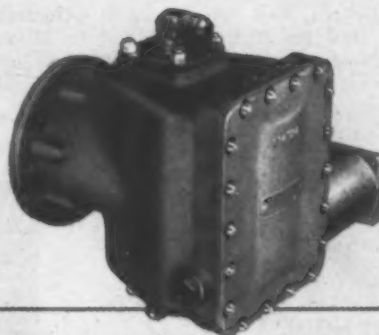


VICKERS
3000 psi
**VARIABLE DISPLACEMENT
PUMPS**
**ON TWA CONSTELLATION
CABIN SUPERCHARGER
DRIVES**

There can be no question of the reliability and lasting qualities of Vickers equipment when it hangs up records like this. TWA maintenance records for 1951 indicate only one unscheduled removal of a Constellation cabin supercharger drive pump in a total of 304,578 pump hours.

These TWA Constellations make use of numerous Vickers Hydraulic units. Besides variable displacement pumps (for main hydraulic system as well as cabin supercharger drive), there are hydraulic motors, pressure reducing valves, relief valves, unloading valves, and accumulators.

Vickers Hydraulic Equipment for aircraft is so widely preferred because it is compact, efficient, light weight . . . but above all dependable.



This is the reversible flow pump used in the Constellation supercharger drive, one of a wide variety of variable displacement piston type pumps available from Vickers. For further information write for new Bulletin A-5203.

VICKERS Incorporated

DIVISION OF THE SPERRY CORPORATION

1502 OAKMAN BLVD. • DETROIT 32, MICH.

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

OCTOBER 27, 1952

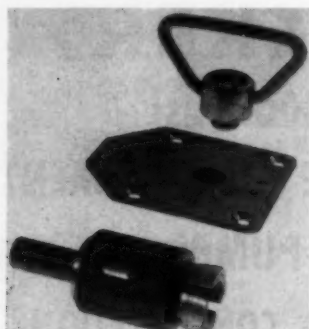
4827



CARGO HANDLING

Cargo Tiedown Fittings

Unit Name	Mfr.	Model	Weight	Capacity	Dimensions	Principal Feature
Ejection clasp	Harley	100	¾ oz.	375 lbs.	1½" x 1" x 9/32"	Quick releasing—light weight
"	"	101	1¼ oz.	600 lbs.	2¼" x 1¼" x 9/32"	
"	"	102	2 oz.	1,400 lbs.	2¾" x 1½" x ¾"	
"	"	103	4½ oz.	2,240 lbs.	3-7/16" x 2" x ½"	
"	"	105	1¼ oz.	5 tons	6½" x 3" x 1"	
Buckles	"	10050	.08 oz.	45 lbs.		
"	"	10075	.15 oz.	50 lbs.		
"	"	1050	.2 oz.	55 lbs.		
"	"	1075	.3 oz.	75 lbs.		
"	"	1100	.4 oz.	100 lbs.		
"	"	2100	.7 oz.	200 lbs.		
"	"	1125	.75 oz.	250 lbs.		
"	"	5200	.8 oz.	100 lbs.		
"	"	6200	.7 oz.	100 lbs.		
"	"	8200	1.2 oz.	250 lbs.		
"	"	9175	3.6 oz.	1920 lbs.		
"	"	9200	4 oz.	1920 lbs.		



● SHIPPING CONTAINER

Mfr.: Tobey Mfg. Co.

Model: EP-197 (see charts for other items)

Weight: 17 lbs.

Capacity: 5 cu. ft. or 200 lbs. (83*)

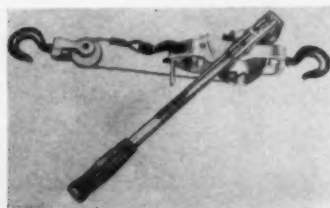


● TIEDOWN FITTINGS

Mfr.: Aviation Developments, Inc.

Model: 5049

General: Ranging in size from ⅜" to 1" and capacity from 3,000 to 10,000 pounds, features quick installation and removal. (84*)



● WINCH HOIST

Mfr.: Lug-All Co.

Model: 3000-HD (see charts for other models)

Weight: 8.75 lbs.

Capacity: ¾ to 1.5 tons

General: Uses drum and aircraft cable to provide lightweight winch. (82*)



● TIEDOWN CABLES (Adjustable)

Mfr.: Peck & Hale

Model: A-4 (see chart for other models)

Weight: 29 oz.

Capacity: 2,000 lbs. (85*)

* For more information see pages 5 and 6.

Catalogs

CABLES AND CABLE UNITS: Macwhyte's "Hi-Fatigue" aircraft cable, "Safe-Lock" cable terminals, and "Hi-Fatigue" cable assemblies and tie rods, are set forth in catalog A-2, where diagrams, tables, and photographs are used to tell dimensions and uses of the products.

LOADING RAMPS: A four-page folder describes the deluxe Model 130 and standard Model 120 Aeroramps for passenger plane boarding, manufactured by the Weber Aircraft Corporation.

WORKSTANDS: A looseleaf brochure pictures and details Aerostands, work stands for industrial uses designed by Weber Aircraft Corporation.

HANGAR DOORS: "Doors for the Airways of Commerce" is a four-page folder prepared by The Fleming Steel Company to present its various types of straight slide and canopy hangar doors.

HARDWARE: Atlas Tack Corporation has issued a series of catalog sheets outlining its complete line of tacks, screws, rivets, nails, burrs, staples, and brads. Sizes and weights are set forth in tabulated columns.

CLEANSERS: "How to Clean Metals in Aircraft Production," prepared by Oakite Products, is a 46-page pamphlet which outlines the cleaners to be used and when to use them in all phases of operation.

LAMINATED PLASTICS: Industrial uses of Farlite high pressure laminated plastics are set forth in a four-page folder, which includes a specification table approved by the Army, Navy, and Air Force.

RIVETS: National Rivet and Manufacturing Company, makers of aluminum, stainless steel, monel and steel rivets to AN standards, have set forth specification tables and price lists in a 16-page illustrated brochure.

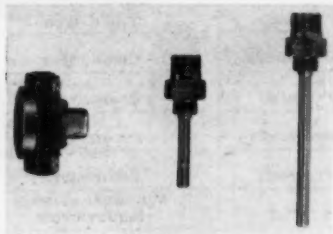
BLIND RIVETS: A series of specification sheets outline and detail applications of Conical Keystone blind rivets made by the Huck Manufacturing Company covering both brazier and flat head types.

CUT FELT PARTS: A data folder and manual describe the cut felt parts manufactured by The Felters Company, listing SAE specification numbers. Samples of the different felt weights are included.

Engineering Data

Unit Name	Mfr.	Model	Weight	Capacity	Dimensions	Principal Feature
Tiedown cargo	Eastern Rotocraft (SP-4015)	AF Type B-1A	4 lbs.	5,000 lbs.	15' overall	Cable type
Tiedown cargo	Eastern Rotocraft (SP-4012)	AF Type C-2	12 lbs.	10,000 lbs.	9' overall	Chain type
Tiedown cargo	Eastern Rotocraft (SP-4014)	AF Type D-1	32 lbs.	25,000 lbs.	9' overall	Chain type
Tiedown cargo	Eastern Rotocraft (SP-4030)	AF Type D-2	50 lbs.	35,000 lbs.	9' overall	Chain type
Tiedown cargo	Eastern Rotocraft (SP-4017)	AF Type B-2	5 lbs.	5,000 lbs.	9' overall	Chain type
Cargo net	Eastern Rotocraft (SP-4026)	AF Type A-2 (cable)	40 lbs.	10,000 lbs.	15' x 15'	Minimum stowage requirements
Tiedown fitting	Adams Rite Mfg. Co.	1519	.63 lbs.	5,000 lbs.	3" x 3" x 1 1/8"	Identical to A.M.C. X50B9017
Tiedown fitting	Adams Rite Mfg. Co.	1417	.21 lbs.	5,000 lbs.	1 1/4" x 3 1/8"	
Wedgit	Adams Rite Mfg. Co.	AR5-5	.16 lbs.	2,700 lbs.	2 7/8" x 3 3/8" x .41"	For quick release of cargo seats
Stud Wedgit	Adams Rite Mfg. Co.	AR 94	.17 lbs.	4,000 lbs.	2 1/2" x 1 1/2"	
3/16" cable	Peck & Hale	A6	33 oz. approx.	4,200 lbs.	13" min. to any max.	Positive lock
1/4" cable	Peck & Hale	A8	4 lb. 10 oz.	7,000 lbs.	17 1/2" min. to any max.	Positive lock
SKY-LOC floor-attach fitting	Aerosmith, Inc.	20091	2.0 oz.	Vert. 2,700 lbs. Hor. 6,800 lbs.	3.062" x 2.187"	Simple, positive operation
SKY-LOC floor-attach fitting	Aerosmith, Inc.	20142	2.5 oz.	Vert. 4,250 lbs. Hor. 8,600 lbs.	3.062" x 2.187"	Simple, positive operation
SKY-LOC floor-attach fitting	Aerosmith, Inc.	30091	2.25 oz.	Vert. 2,800 lbs. Hor. 7,250 lbs.	3.437" x 2.875"	Simple, positive operation
SKY-LOC floor-attach fitting	Aerosmith, Inc.	30142	2.80 oz.	Vert. 3,250 lbs. Hor. 7,600 lbs.	3.437" x 2.875"	Simple, positive operation
SKY-LOC floor-attach fitting	Aerosmith, Inc.	40091	2.5 oz.	Vert. 2,050 lbs. Hor. 6,750 lbs.	3.75" x 2.875"	Simple, positive operation
SKY-LOC floor-attach fitting	Aerosmith, Inc.	40142	3.0 oz.	Vert. 2,250 lbs. Hor. 7,000 lbs.	3.75" x 2.875"	Simple, positive operation
Aerial delivery platform	SAC	Heavy vehicle & weapon type		3,500 lbs. (gross)	108" x 132" x 6"	Limits landing shock to less than 10 g.
Aerial delivery cargo container	SAC	Universal type		6,000 lbs. (gross)	108" x 108" x 66"	Limits landing shock to less than 10 g.
Aerial cargo platform restraints	SAC	Cargo airplane		18,000 lbs.	Secures aerial delivery platforms prior to extraction	
Roller conveyors	SAC	For use with aerial delivery platforms		18,000 lbs.	8" wide x 3" high	Used with extraction parachute method of aerial resupply
Explosive parachute disconnect	SAC	OC-2000		50,000 lbs. load factor	Separates parachutes from load at ground contact to prevent toppling	
Aerial resupply platforms	SAC	Air bag type	12 lbs.	3,000 lbs. bag	36" x 36" x 3" (stowed)	Limits landing shock to less than 10 g.
Airborne container	Tobey Mfg. Corp.	E.P. 461	153 lbs.	9 cu. ft. or up to 1,000 lbs.	36" x 36" x 36"	Aluminum—lightweight & sturdy
Instrument shipping rack—airborne	Tobey Mfg. Corp.	E.P. 539	170 lbs.	54 sq. ft. of shipping area	Width 36" height 54" length 72" extended 18" collapsed	Aluminum—saves extensive packings of instruments
Airborne pallets	Tobey Mfg. Corp.	Various	Lightweight aluminum	As needed	As needed	Saves weight
Racks	Tobey Mfg. Corp.	Various	Lightweight aluminum	As needed	As needed	Folds flat when not in use; lightweight
Containers, special	Tobey Mfg. Corp.	Built to fit needs of applicants—designed and built from lightweight, sturdy, heat-treated aluminum extrusions				
Airborne tote box	Tobey Mfg. Corp.	E.P. 197	17 lbs.	5 cu. ft. or 200 lbs.	22" x 28" x 13"	Lightweight; may be sealed
Winch	Lug-All Co.	2250	8 1/2 lbs.	1,125-2,250 lbs.	15 ft. reach at 1,125 lb. capacity; 7 1/2 ft. reach at 2,250 lb. capacity	
Holst	Lug-All Co.	1500	8 1/4 lbs.	750-1,500 lbs.	25 ft. reach at 750 lb. capacity; 12 1/2 ft. reach at 1,500 lb. capacity	

Engine Instruments



● RESISTANCE BULBS

Manufacturer: The Lewis Engineering Co.

Model: Typical

General: Used for free air temperature, oil, carburetor air, etc., as sensing elements in electrical gauging arrangement. (86*)



● ENGINE GAUGE

Manufacturer: Thomas A. Edison, Inc.

Model: 195

Weight: 1.25 lbs.

Dimensions: Meets AN 5773, MIL-G-7090

General: A single instrument containing fuel and oil pressure gauges plus oil temperature. (87*)

● PRESSURE TRANSMITTER

Manufacturer: Eclipse Pioneer, Div. of Bendix Aviation Corp.

Model: 7600

Weight: 1.4 lbs.

Dimensions: 2 29/64" dia. x 7 5/64"

General: An autosyn type pressure transmitter for oil, water, torque, and hydraulic pressure. The model 7600 is used in conjunction with a cockpit instrument and provides ranges from 0-50 psi up to 0-5,000 psi. Operates on 26-volt, 400-cycle, single-phase current. (88*)

FOR PERFORMANCE THAT MEETS EVERY "SPEC"

UNIVERSAL METAL PRODUCTS, INC.
Tools • Dies • Metal Stampings • Aircraft Parts

2001 E. Main Street, El Paso, Texas • 512-833-1111



● AIR TEMPERATURE GAUGE

Manufacturer: Scott Aviation Corp.

Model: 2-716 (see chart for other models)

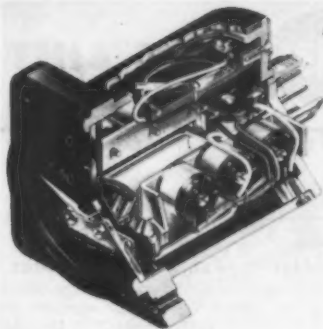
Weight: 4 oz.

Dimensions: 2 1/8" x 4"

General: A mechanical instrument with both Fahrenheit and Centigrade scales. (89*)

* For more information, see pages 5 and 6.

AMERICAN AVIATION



● TEMPERATURE GAUGE

Manufacturer: Thomas A. Edison Co.

Model: 200

Weight: ½ lb.

Dimensions: Standard instrument

General: A 28-volt d-c temperature indicator with minus 70° C. to plus 300° C. (90°)



● OIL PRESSURE GAUGE

Manufacturer: Scott Aviation Corp.

Model: RN-2550

Weight: 5 oz.

Dimensions: 2¼" x 1"

General: A direct-reading gauge with pressure range of 0 to 120 lbs. (91°)



● TEMPERATURE GAUGE

Manufacturer: The Lewis Engineering Co.

Model: 49B (see chart for others)

Weight: 12 oz.

Dimensions: 2" face

General: Thermocouple type temperature gauge available in all normal ranges. (92°)

* For more information see pages 5 and 6.



Looking
For
More
Information?

See pages 5 & 6.

Among the Catalogs

FINISHING: "The Lea Method of Finishing" is a 160-page reference book and instruction manual for proper procedures of polishing, buffing, and burring of metals, plastics, and woods. Various case studies are included.

TESTING MACHINES: Specification sheets and illustrations comprise the contents of a booklet put out by Greer Hydraulics, Inc., including all the line of testing machines made for the aviation industry.

pattern of progress



From:
BOOTS AIRCRAFT NUT CORPORATION
STAMFORD, CONN.

Ship to: _____
Address: _____
Customer P. O. _____ Case No. _____
Customer Part _____ Quantity _____
Boots Part No. _____
Shipped Via _____

ALLISON
AMERICAN AIRLINES
BEECH
BELL
BOEING
CANADAIR
CHANCE VOUGHT
CONVAIR
DE HAVILLAND
DOUGLAS
FAIRCHILD
GENERAL ELECTRIC
GRUMMAN
KAISER-FRAZER
LOCKHEED
GLENN L. MARTIN
McDONNELL
NORTH AMERICAN
NORTHROP
PRATT & WHITNEY
REPUBLIC
A. V. ROE
RYAN
SOLAR

Leading aircraft manufacturers each using **BOOTS** all-metal self-locking nuts are combining their resources to help restore world peace. For each producing a finished aircraft, there are countless sub-contractors supplying them with integral parts. >>
BOOTS is proud of its established position of leadership... providing, in compliance with AN-N-5 and AN-N-10 specifications, all-metal self-locking nuts used by these companies. Whatever your lock-nut needs or problems, consult **BOOTS** engineers. Experimental quantities supplied at no charge.

Full specifications... and necessary technical data on the complete line of **BOOTS** all-metal self-locking nuts available in our catalog. *Free*

WRITE:

BOOTS Aircraft NUT CORPORATION
NORWALK, CONNECTICUT



Fire Detectors

Engineering Data

Unit Name	Mfr.	Model	General Type	Wt.	Rating	Dimensions Lgth.-Wdth.-Hgt.	Range	Remarks
Fire detector	Thos. A. Edison Inc.	108-10	Thermocouple	.050 lbs.	.....	2 1/8" dia. x 1 1/8"	To 70° F. max.	For aircraft engine nacelle installation
"	Fenwal Inc.	17343-61	SPST single terminal, herm. sealed	.135 lbs.	2 amps. 28 v d-c	4 1/4" x 1 1/8"	200° to 450° F.	Aircraft fire det. Makes on increase. CAA TSO C11a & AS401a
"	"	17343-62	SPST two-terminal, herm. sealed	.155 lbs.	2 amps. 28 v d-c	5" x 1 1/8"	200° to 450° F.	Aircraft fire det. Makes on increase. CAA TSO C11a & AS401a
"	"	17343-11	SPST single terminal, herm. sealed	.125 lbs.	2 amps. 28 v d-c	4 1/4" x 1 1/8"	300° to 1000° F.	Aircraft overheat det. Makes on increase. Non-adjustable.
"	"	17343-16	SPST single terminal, herm. sealed	.135 lbs.	2 amps. 28 v d-c	5" x 1 1/8"	100° to 1000° F.	Aircraft overheat det. Makes on increase. USAF Spec. 41379B. Adjustable.
"	"	17343-29	SPST single terminal, herm. sealed	.135 lbs.	2 amps. 28 v d-c	5" x 1 1/8"	100° to 1000° F.	Aircraft overheat det. Makes on increase. Adjustable.



● FIRE DETECTOR

Manufacturer: Fenwal, Inc.

Model: 17343-6

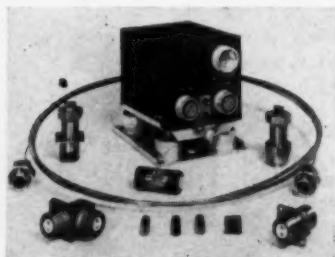
Weight: .125 lbs.

Dimensions: 4 1/2" x 1-7/16" overall

Operating Range: 200°-450° F.

General: A single-pole, single-throw switch which makes contact with increasing temperatures. Rated for 2 amps. at 28 volts d-c. Used to complete the ground circuit for a warning light mounted in the cockpit.

(93*)



● FIRE DETECTOR SYSTEM

Manufacturer: Walter Kidde & Co.

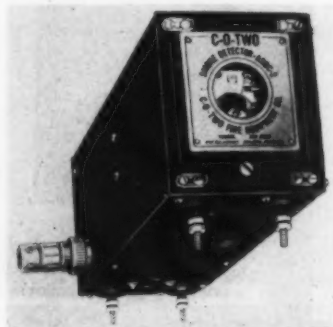
Model: Continuous Resetting

Weight: 5 lbs. (per nacelle)

Dimensions: 3" x 3" x 4" (control unit)

General: The Walter Kidde fire detector system has no moving parts. A tubing-like detector element, containing detector wires isolated by a chemical type insulator, is routed through the zone being protected. A sudden increase in ambient temperature breaks down the insulating characteristics of the chemical and completes the warning circuit. A reduction in temperature reestablishes the insulating qualities, "resetting" the system.

(94*)



● SMOKE DETECTOR

Manufacturer: C-O-Two Fire Equipment Co.

* For more information see pages 5 and 6.

Model: Photoelectric detector ASDT-3

Weight: 2 lbs.

General: In the C-O-Two smoke detector a controlled light beam is passed alongside a photoelectric cell; air is constantly drawn through the compartment. When smoke in this air reflects light on the photoelectric cell, the cell generates enough current to actuate a pilot relay, which in turn operates a master relay and signal system of the visual or audible type.

(95*)



● SMOKE DETECTOR

Manufacturer: Walter Kidde

Model: Visual Smoke Detector

THIS NEW **AEROTHERM** LUXURY PASSENGER SEAT

gives you a comfortable ride by day and a refreshing sleep by night



The Slumberryde* was designed for Pan American World Airways' new DC-6B Clippers. It provides the ideal seating combination for relaxing day and night air travel. Cushioned with thick foam rubber, it provides body-fitting comfort in any position. Requires less space than conventional berths for overnight flights.

Flexibility is an important feature of the Slumberryde. It is adaptable to a wide variety of seating arrangements, can be faced forward or aft, on either side of the ship. This seat is particularly adaptable to a unique type of installation that permits attaching, detaching, or spacing the seats with ease to meet pay-load requirements. The back folds forward to

simplify handling and to facilitate passenger-cargo operations.

AEROTHERM seats are designed so that small detail parts, rather than whole major assemblies, can be replaced at scheduled stops quickly, easily, and inexpensively. The Slumberryde is contoured to fit the Douglas DC-4 and DC-6, Boeing Stratocruiser, and Lockheed Constellation.

Thousands of AEROTHERM seats now in use by many famous airlines indicate the ability of our designers to help solve your aircraft seating problems. Why not write or call our representative nearest you today for engineering aid or for AEROTHERM literature.

*Reg. T.M. Applied for.

FIELD PROJECT ENGINEERS—AIRCRAFT DIVISION

CLEVELAND 29, OHIO
Jay Engineering Co., 5413 Pearl Rd.

NORWALK, CONN.
John S. Hammond, Jr., 394 West Ave.

ROSLYN HEIGHTS, L. I., N. Y.
John S. Hammond, Jr., 25 Edwards St.

SEATTLE 2, WASH.
Stanley R. Brett
John E. Freeman & Assoc., 1616-F 43rd N.

REG. TRADE MARK

THE THERMIX

DAYTON 3, OHIO
Jay Engr. Co., 1517 East 3rd St.
LOS ANGELES 43, CAL.
Forsnes Engr. Co., 4545 West 62nd Bl.

WICHITA 8, KANSAS
J. E. Freeman & Assoc., 4913 East Lewis St.
MONTREAL and TORONTO
T. G. Clowd Ltd.
Canadian Affiliates

THE THERMIX CORPORATION

GREENWICH, CONN.

PROJECT ENGINEERS

AEROTEC

AEROTHERM

HEACON

pd

MORE LUXURY FLIGHTS TO FLORIDA!



**This Winter National Doubles Its Luxury Fleet
with New DC-6B's!**

THE *Star* between
NEW YORK PHILADELPHIA*
WASHINGTON MIAMI
JACKSONVILLE
TAMPA (St. Petersburg)
PALM BEACH**
HAVANA

**Effective Dec. 1 *Effective Dec. 12

There'll be more Stars in the sky to Florida this winter! Yes, the nation's newest fleet of DC-6B's joins National's luxurious DC-6's. Every day 1000 more Florida vacationers will enjoy world-famed Star service at standard fare.

Book Reservations Now!

NATIONAL Airlines *Airline of the Stars*



Presenting THE MOST
LUXURIOUS
TRANSCONTINENTAL
AIR SERVICE
EVER OFFERED

TWA's New SUPER CONSTELLATIONS
The Ambassadors

Nightly from New York, Chicago
and Los Angeles

See your travel agent, or call
Trans World Airlines

ACROSS THE U.S. AND OVERSEAS... **FLY TWA**
TRANS WORLD AIRLINES

Weight: 1.2 lbs.

Dimensions: 3½" dia. x 4" long

General: The Walter Kidde smoke detector provides the simplest type detection. Air is drawn through the instrument from the compartment being protected. Viewing windows in the face of the instrument permit the pilot to inspect the air. Normally no signal is apparent but the presence of smoke reflects light on a mirror offering him a steady or flashing indication. Unit is designed to serve two compartments. (96*)



● FIRE & CO DETECTOR

Manufacturer: Mine Safety Appliances Co.

Model: DR 45878

Weight: 8 lbs.

General: A thermocouple assembly is buried in a chemical canister. Air is constantly drawn through the canister from the compartment under surveillance. Presence of carbon monoxide, said to be present whenever fire exists, causes the chemical to heat. The thermocouple generates electrical current as the result of this heat actuating a visual or audible warning system. A selector permits use of one detector sampling a number of compartments. (97*)

* For more information see pages 5 and 6.

Catalogs

FIRE GUARDS: A 32-page catalog outlines the uses and illustrates the Quick Aid Fire Guards and accessory equipment manufactured by The General Pacific Corporation.

HAND TOOLS: Champion DeArment Tool Company presents its line of mechanics' hand service tools in catalog No. 950, incorporating the complete line of Channellock pliers.

AMERICAN AVIATION

Pneumatics

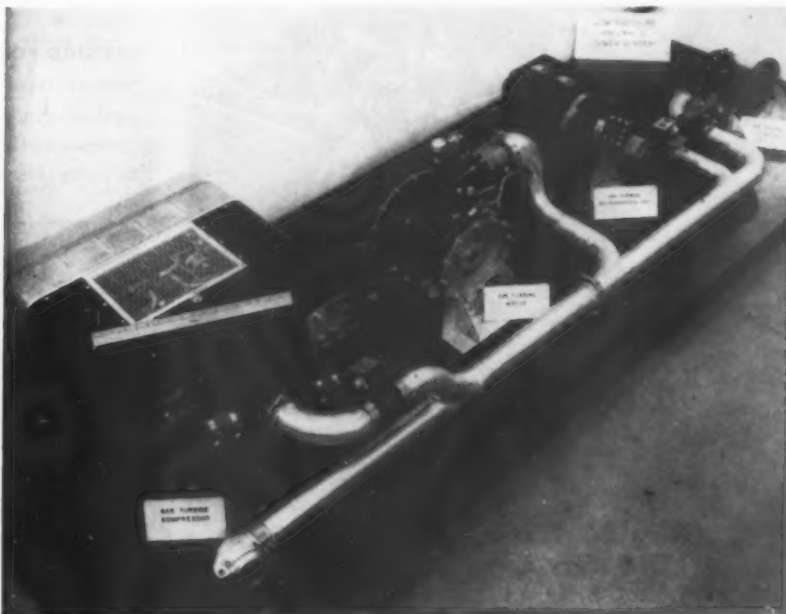
Engineering Data

Unit Name	Mfr.	Model	Wt.	Power Req.	Output	Dimensions Dia.-Lgth.-Wdth.-Hgt.	Example of Exist. Inst.	Type Drive
Air compressor	The Cornettus Co.	32-R-400	9.6 lbs.	27 v 21½ amp. d-c	1,500 psi	0.4 cfm	Bomb bay doors	Integral
"	"	32-R-500	"	"	"	"	Gun chargers	"
"	"	32-R-501	"	"	2,500 psi	"	Ground charger	"
"	"	32-R-900	12 lbs.	200 v 400 cycle a-c	1,500 psi	"	11E turret	Belt
"	"	130RO300	12.8 lbs.	Hydraulic drive	3,000 psi	"	"	"
"	"	130RO800	14 lbs.	Engine drive	3,000 psi	4.0 cfm		Spline
"	"	130RO700	18 lbs.	Hydraulic drive	"	"		Integral
"	Kidde	870305	17.75	3.5 hp	.31 lbs air per min. 3,000 psi.	11½" x 11" x 9½"	F84G pneumatic system	Hydraulic 1,500 psi system
"	"	870440	33 lbs.	27 v 125 amps.	"	21¼" x 9¾" x 11"	Navy fighter	27 v d-c electric motor
"	"	870304	32 lbs.	3.5 hp	"	19" x 12" x 12¼"	Navy patrol bomber	400 cycle 208 v electric motor
"	"	SK117955	12 lbs.	"	"	6½" x 9¼" x 11"	Exper- mental	Direct aircraft engine drive
"	"	870589	19.5 lbs.	"	"	12¾" x 9¾" x 11"	Air Force fighter	Hydraulic 3,000 psi system

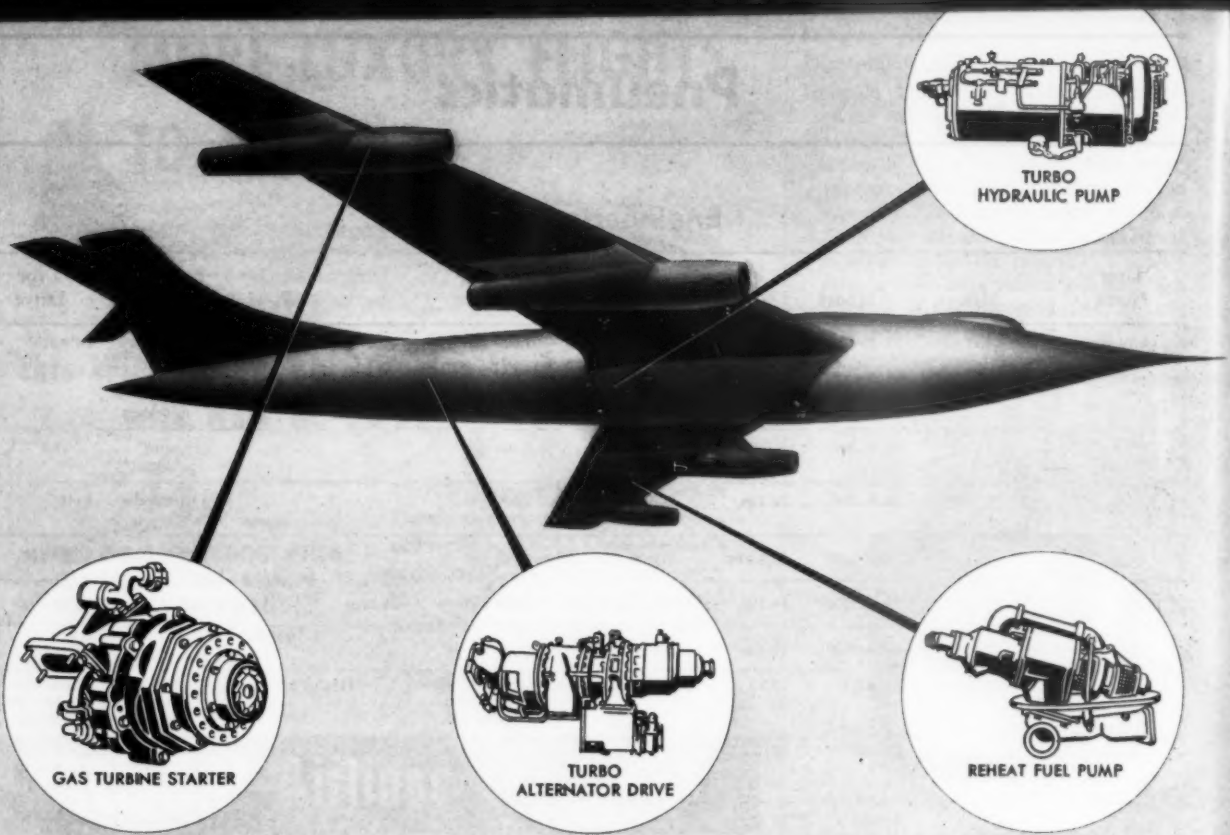
● PNEUMATIC SYSTEM

Manufacturer: AiResearch Mfg. Co.

General: A complete low pressure pneumatic system for airborne use, designed and manufactured by AiResearch as shown above includes a self-powered gas turbine compressor, air turbine motor, refrigeration unit, and starter. (98*)



* For more information see pages 5 and 6.



New G-E Accessory Equipment for Jet Aircraft



EXPERIENCE. . . G.E. has been developing and producing aircraft turbines since Dr. Moss developed the first turbosupercharger (1918).

Units Can Be Designed For Any Size Airplane

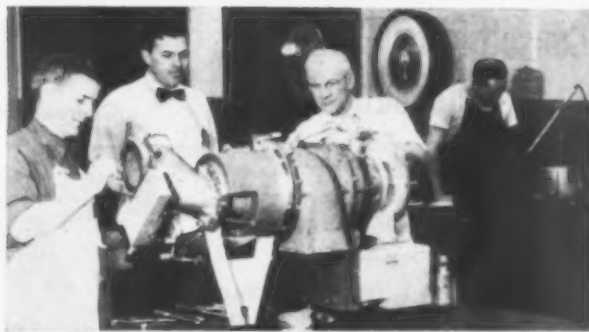
DESIGNED FOR JET AIRCRAFT, new aircraft accessory turbines produce reliable auxiliary power under all conditions. Each product in the line features a high power-to-weight ratio and occupies a relatively small space. All are self-contained and can be easily removed for maintenance.



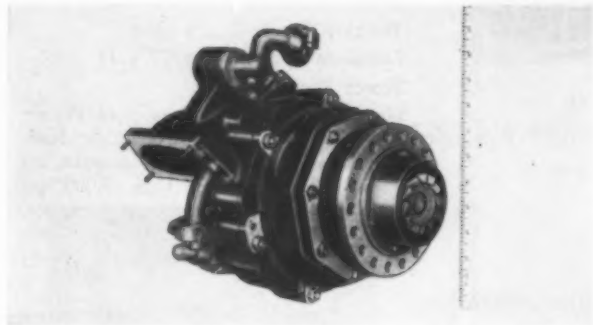
TESTING. . . Accessory turbines are tested under simulated operating conditions. Shown above is turbopump altitude chamber.



TURBO HYDRAULIC PUMPS bleed air from jet engine compressor to supply hydraulic power for entire airplane.



TURBO ALTERNATOR DRIVES bleed air from jet engine compressor to supply electric power for entire airplane.



GAS TURBINE STARTERS operate on expanding gases from solid or liquid propellants to give fast starts, without ground power.



REHEAT FUEL PUMP bleeds air from jet engine to supply extra flow of fuel for afterburner operation.

Saves Weight, Space, Maintenance Time

RANGE OF APPLICATION for these turbines is unlimited. They can be designed for the smallest fighter or the heaviest bomber. However, each individual airplane determines the detailed specifications that the drives will be designed for. It is important, therefore, that consideration of the drives be given when airplane design is beginning.

THE NEW LINE of turbine-driven auxiliary power at the present time includes: (1) air turbine-drives for alternators and turbo-hydraulic pumps which can be conveniently located anywhere aboard the airplane, (2) air turbine-driven reheat (afterburner) fuel pumps which allow climb rates of thousands of feet per

minute, and (3) gas turbine starters which start engines within seconds, without ground power.

OTHER ACCESSORY TURBINE PRODUCTS are now in the design stage. In developing these new aircraft accessory turbines, G-E engineers are applying the knowledge of 35 years of developing and building aircraft turbines. This experience plus the manpower and know-how of General Electric is at your disposal to help solve your auxiliary power problems.

For more detailed information contact your nearest General Electric Aviation Specialist. *General Electric Company, Section 210-63, Schenectady 5, N. Y.*



SERVICE... G-E service shops are strategically located for aircraft gas turbine and accessory equipment overhaul.

FOR MORE INFORMATION

Persons desiring more detailed information on G-E Accessory Equipment can obtain copies of bulletins listed below. Write General Electric Company, Section 210-63, Schenectady 5, N. Y.

- GEA-5815 Accessory Turbines for Jet Aircraft
- GEA-5870 Air Turbine Drives for Jet Aircraft
- GEA-5871 Aircraft Afterburner Fuel Pumps
- GEA-5872 Aircraft Gas Turbine Starters

GENERAL  ELECTRIC

Consult your 1952 I.A.S. "Aeronautical Engineering Catalog"

for complete information
on AIRBORNE'S

ROTORette — LINEATOR — ROTORAC
& TRIM-TROL ELECTRO-MECHANICAL
ACTUATORS. Also ANGLgear RIGHT-
ANGLE BEVEL GEAR UNITS.



AIRBORNE
ACCESSORIES CORPORATION

1414 Chestnut Avenue
Hillside 5, New Jersey

Pneumatics

(Continued from Page 61)



● AIR TURBINE DRIVE

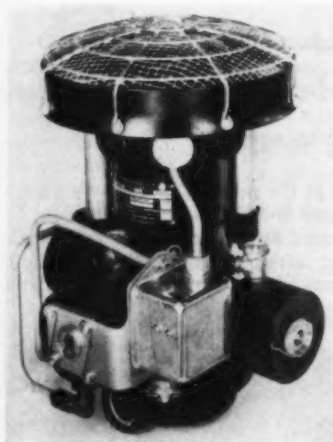
Manufacturer: Stratos Div., Fairchild
Engine & Airplane Corp.

Model: TP 15-2

Weight: 35 lbs.

Power Req'd.: 40 hp

General: Air turbine drive used to op-
erate alternators in radar interceptors.
Holds frequency within plus or minus
1 cycle/second under all system de-
mands. (99*)



● AIR COMPRESSOR

Manufacturer: The Cornelius Co.

Model: 130 RO 100

Weight: 16.25 lbs.

Output: 2 cfm at 3,000 psi

General: Operating from a 27-volt, 60-
amp, d-c power supply the model 130
RO 100 provides air for gun charger
operations. See chart for other models.
(100*)



● AIR COMPRESSOR

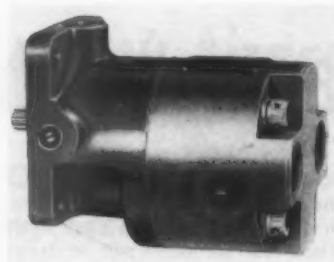
Manufacturer: Walter Kidde & Co.
Model: 870589

Weight: 19.5 lbs.

Dimensions: 12 7/8" x 9 7/8" x 11"

Power Req'd.: 3.5 hp

General: Typical of a series of Walter
Kidde hydraulic powered air com-
pressors used as power sources for
pneumatic systems. Uses 3,000 psi
hydraulic motor for power source.
Other models (see chart) use electric
or engine driven power source. (101*)



● PNEUMATIC MOTOR

Manufacturer: Lear, Inc.

Model: RD-7440A

Weight: 1.5 lbs.

Dimensions: 3 11/16" x 2 7/16" x
2 7/16"

Output: 25 in.-lbs. at 1,000 psi air
pressure.

General: Equipped with a 12-tooth spline
at drive end. (102*)



**Looking
For
More
Infor-
mation?**

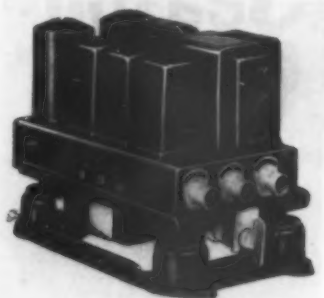
See pages 5 & 6.

AMERICAN AVIATION

Fuel Quantity Indicators



Fuel Gauge



Amplifier



Typical Tank Unit

MINNEAPOLIS-HONEYWELL GAUGING SYSTEM (103*)



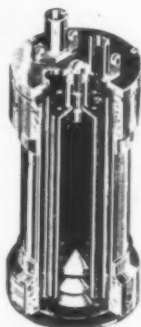
Gauge, Tank Unit and Amplifier

SIMMONDS AEROCESSORIES
PACITRON SYSTEM (104*)

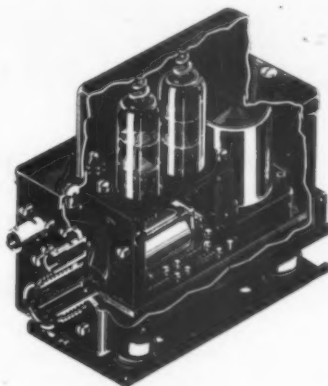
THREE examples of current capacitance type fuel quantity indicating systems are shown on this page. This type system eliminates moving parts from the fuel tank areas and provides temperature-corrected quantity indications which can be read in either pounds or gallons.

No specific details about the individual system components are given here since the systems are very flexible, with a tank unit, amplifier, and instrument making up a complete system. Actually the number of units vary widely, depending on the size and shape of the fuel tank. The electronic fuel gauge has replaced all other types in all large military airplanes now in production.

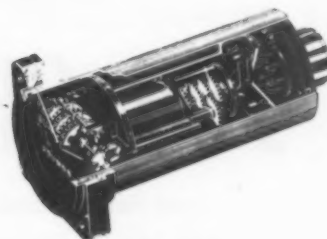
AVIATION ENGINEERING CORP.'S GAUGING SYSTEM (105*)



Tank Unit



Amplifier



Fuel Gauge

* For more information see pages 5 and 6.

Visit MEXICO during American's Fiesta Fare Season



50% OFF

Your Return Fare!
(Sept. 15th thru Dec. 15th)



Choice of 3 to 10 day Package Tours



Generous 15 day Return Trip Limit



Flagship Luxury Going and Coming



AMERICA'S LEADING AIRLINE

AMERICAN AIRLINES INC.

AMERICAN AVIATION

Actuators



● JATO RELEASE ACTUATOR

Manufacturer: Air Associates Inc.
Model: EE 5410
Weight: 2.65 lbs.
Output: 150 in.-lbs. at 9 rpm
Dimensions: 7.75" long, 1.88" wide, 3.93" high
General: A typical rotary actuator with a 60°-360° rotation, such as used on the Republic F-84F as a Jato release. (106*)



● COWL FLAP SYSTEM ACTUATOR

Manufacturer: Air Associates, Inc.
Model: M-2975
Weight: 11.7 lbs.
Output: 863 lbs. plus torque drive
Dimensions: 12.98" retracted x 7.44" wide x 10.97" high
General: A typical linear plus rotary actuator with 6.25" travel such as used in the Lockheed P-2V4 cowl flap actuation. (108*)



● ROTARY ACTUATOR

Manufacturer: Airborne Accessories Corp.
Model: R-412 Rotorette
Weight: 1.3 lbs.
Output: 10 lb.-in.
Dimensions: 4.8" x 2.4" x 3.3"
General: A typical rotary actuator with 80° travel, such as is used in Republic F-84 installations. (110*)



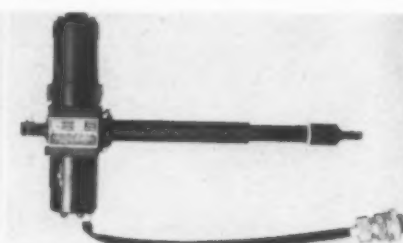
● ENGINE AIR DOOR ACTUATOR

Manufacturer: Air Associates Inc.
Model: M-2790
Weight: 5.85 lbs.
Output: 500 lbs.
Dimensions: 11.5" retracted, 2.76" wide, 6.25" high
General: A typical linear actuator with a travel of 4.20" such as used in military fighter engine installations for air door operation. (107*)



● CANOPY ACTUATOR

Manufacturer: Air Associates, Inc.
Model: EE 171 OM1
Weight: 9.5 lbs.
Output: .54 hp at 62 rpm
Dimensions: 10.2" long x 4.4" wide x 4.8" high
General: A typical rotary actuator such as used for operation of canopy of jet fighters. (109*)



● LINEAR ACTUATOR

Manufacturer: Airborne Accessories Corp.
Model: 244M3
Weight: 2.2 lbs.
Output: 100 lbs. max.
Dimensions: 10.2" x 7.5" x 1.7"
General: A typical linear actuator with a travel of 4.7 inches, such as is used in Martin P-5M installations. (111*)

* For more information see pages 5 and 6.

COMING SOON!

Republic's newest member in a proud family of established fighter fame... the F84F Thunderjet is starting to come off our production lines. Prototype models have passed all acceptance tests and the already well-known swept-back wing model will be welcomed by Air Force pilots familiar with its battle-proved predecessors.



Rough... tough... and deadly... its tremendous fire power... longer range... heavy armament for effective close support performance... its greater speed and higher ceiling for air combat... make the F84F the ideal weapon for interdiction and all fighter requirements.

REPUBLIC AVIATION

FARMINGDALE, LONG ISLAND, N. Y.

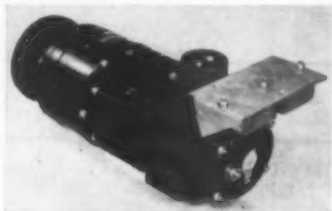


Makers of the Mighty Thunderbolt • Thunderjet • XF-91 • **F84F**



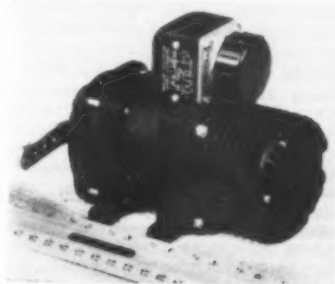
● ACTUATOR

Manufacturer: Minneapolis Honeywell Reg. Co.
Model: MG-7008
Weight: 5.5 lbs.
Output: 20 in.-lbs. stalled torque
Dimensions: 8.75" x 6.375" x 3.75"
General: A rotary actuator for general applications providing 90° rotation in .52 seconds. (112*)



● ACTUATOR

Manufacturer: Jack & Heintz
Model: D2-10
Weight: 28.25 lbs.
Dimensions: 5 1/2" dia. x 13 31/32"
Output: 4 hp.
General: A typical Jack & Heintz rotary actuator, the D2-10 is used to operate the Boeing B-47 nose landing gear. Operates on 28-volt, d-c power supply. (113*)



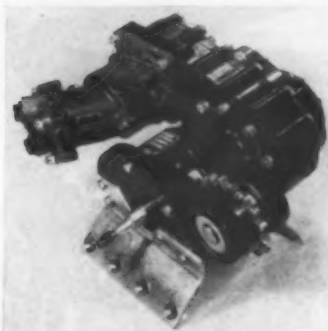
● ACTUATOR

Manufacturer: Minneapolis Honeywell Reg. Co.
Model: MG-7011
Weight: 2.3 lbs.

Output: 22.5 in.-lbs. stalled torque

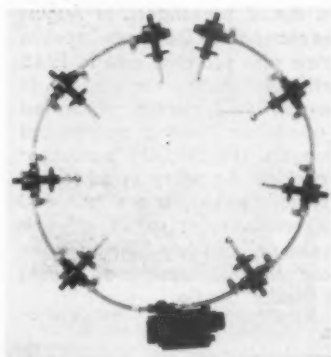
Dimensions: 5.75" x 3.5" x 4.25"

General: Operating on 115 volt a-c 400 cycle current the MG-7011 actuator provides 90° rotation in three seconds. Includes a friction brake. (114*)



● ACTUATOR

Manufacturer: Jack & Heintz
Model: D115
Weight: 33.5 lbs
Dimensions: 13 7/8" x 11 11/16" x 6"
Output: 218 lb.-ft./min. at 265 rpm.
General: A hydraulically operated actuator using a Vickers motor as a power source to control the refueling boom on Boeing KC 97 aircraft. (115*)



● COWL FLAP SYSTEM

Manufacturer: Lear, Inc.
Model: 8056 retracting system
Weight: 11 lbs., plus flex-shafting
General: A typical cowl flap actuating system including 710A flexible shafting. Maximum torque of model 150C power unit shown is 6.4 lb.-in. at 1,900 rpm. The 586B screwjacks weighing 0.85 lbs. each have an ultimate strength of 1,100 lbs. compression or tension. (116*)

* For more information see pages 5 and 6.



● SERVO ACTUATOR

Manufacturer: Schwien Engineering Co.
Model: USAF type D-7
Weight: 1.5 lbs.
Output: 100 in.-lbs. at 1 1/2 rpm
Dimensions: 3 3/32" dia. x 3 5/16"
General: A rotary actuator adjustable through plus or minus 80° from center position, as used on helicopter control sticks. (117*)



● MAGNETIC BRAKE

Manufacturer: Airborne Accessories Corp.
Model: R-42 OM 5-1
Weight: 2 lbs.
Output: 112 lb.-in.
Dimensions: 6.3" x 3.6" x 1.8"
General: A rotary actuator with 90° travel, such as is used in the Piasecki HUP-1 helicopter. (118*)



● SCREW JACK

Manufacturer: Lear, Inc.
Model: 564A
Weight: 1.6 lbs.
Output: 1,500 lbs. compression, 1,150 lbs. tension. Maximum static load—560 lbs. compression and 80 lbs. tension.
General: One of a series of Lear Screw-jacks incorporating a quick-disconnect feature. (119*)



PIONEER *

The Nation's Oldest Local Service Airline



Pioneer, the nation's oldest local service airline, began service on August 1, 1945, with three Lockheed Electra nine-passenger planes. The Company's 683-mile route was from Houston to Amarillo via Austin, San Angelo, Abilene and Lubbock. By the end of the year, Pioneer had safely transported 4,452 passengers. In August and September of 1946, Pioneer changed to DC-3's to improve service. Pioneer continued to grow and progress and in 1948 ILS was installed on all aircraft, substantially contributing to operational safety. In August, 1952, Pioneer celebrated its seventh year of operations, having transported some 678,000 passengers 180,312,000 passenger miles without fatal accident or injury in scheduled operations. Today, Pioneer employs more than 450 persons, flies 2,000 route miles to 21 cities in Texas and New Mexico and has nine 36-passenger, 270-mile-per-hour Martin Pacemaster planes equipped with Bendix* Radio.

*REG. U.S. PAT. OFF.

Bendix Radio
most Trusted name in

VHF Transmitters • H. F. Transmitters • Radio Control Panels • Antennas • Indicators • Automatic Radio Compasses • Marker Beacon Receivers • Announcing Systems • VHF Communication and Navigation Receivers • Inter-Communication Systems • H. F. Receivers • Ground Controlled Approach Landing Systems • VHF Omni-Directional Range Systems.



• WASTE GATE MOTOR

Manufacturer: Minneapolis-Honeywell Reg. Co.

Model: MG-7012

Weight: 5.5 lbs.

Output: 100 in.-lbs. stalled torque

Dimensions: 8.72" x 6.375" x 3.75"

General: A rotary actuator requiring 230 volt a-c, 400 cycle current and operating through 90° travel in three seconds. Incorporates a solenoid brake. Typical installation on bombers and transports in turbo supercharger systems. (120*)

Catalogs

LIGHTING EQUIPMENT: A loose-leaf catalog, covering such subjects as aviation beacons, airport marker lights, control desks and panels, weather equipment, and lighting accessories and parts, has been issued by the Crouse-Hinds Company and encompasses the complete line. An index and price list are incorporated.

BALL BEARINGS: The 21st edition of "New Departure Handbook" contains data for the selection and application of ball bearings for general use, including dimensions, load ratings, load conversion factors, bearing tolerances, and shaft housing fits. The New Departure Division of General Motors Corporation is responsible for the book.

MOTORS AND GENERATORS:

Catalog sheets list specifications and utilize photographs to show the complete line of motors and generators manufactured by the Century Electric Company. Motor types included are capacitor start; squirrel cage; totally enclosed fan cooled; wound rotor induction polyphase. Generator types encompass uni-control a-c; d-c; motor generator sets; synchronous a-c.

TORQUE TOOLS AND INSTRUMENTS:

Torque tools and testing equipment manufactured by Richmond, Inc., are all included in a 14-page booklet, which is illustrated and carries price lists.

AMERICAN AVIATION

PORTABLE TOOLS: Skilsaw, Inc., sets forth in its buyers' guide for 1952 its complete line of industrial tools, including saws, drills, and screwdrivers. Utilizing tables and photographs.

STEEL EQUIPMENT: Berger Manufacturing Division of Republic Steel Corporation has published the following catalog covering its manufactured equipment: Catalog ET-587 on tool room and shop equipment; Catalog EA-505 on steel merchandising equipment and storage units; Catalog ES-786 on convertible steel shelving; and Catalog EL-561 on steel lockers for industrial needs, as well as other uses.

HEAVY INDUSTRIAL MACHINES: Pennsylvania Pump & Compressor Company has a looseleaf folder containing catalog sheets which fully describe and give specifications for the following industrial equipment: horizontal stage heavy duty compressors; Oilfreair and Oilfregas compressors; horizontal duplex heavy duty compressors; steam turbine driven duplex compressors; single-stage and two-stage dry vacuum pumps; Type U centrifugal pumps; and Thrustfre centrifugal pumps.

MACHINE TOOLS: A series of brochures published by the Farnham Manufacturing Division of the Wiesner-Rapp, Co., Inc., cover the following products: Bulletin No. F-101, production machines for the aircraft industry; Bulletin No. F-102, milling machines; Bulletin No. T-103, twist milling machines; Bulletin No. 21513-E, utility mill for close tolerance profile or straight milling; Bulletin No. 11727-D, forming roll; Bulletin No. 11078-C, mill countersinker.

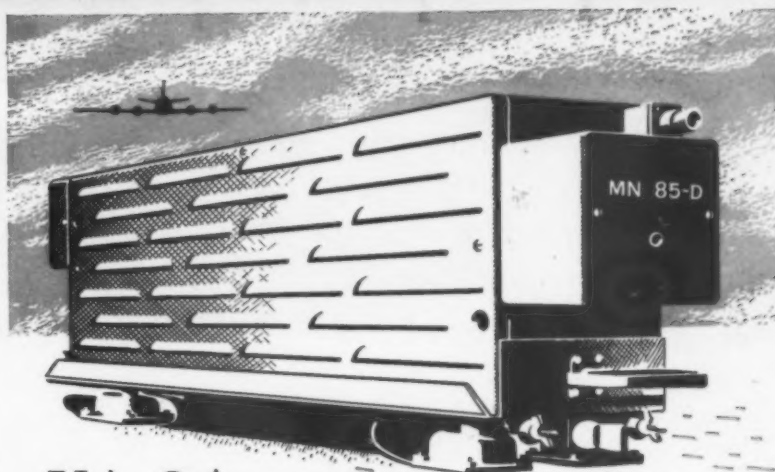
COUPLINGS: Roylyn Products' 18-page catalog discusses design characteristics and applications of quick couplings, valves and coupling-valves, filler-unit assemblies, and hose-coupling assemblies.

VISCOUS LIQUID: A folder prepared by Thiokol Corp., describes the properties of Thiokol LP-2, a viscous liquid which converts to solvent-resistant rubber at room temperature.

WELDING ELECTRODES: Available from General Electric welding distributors, a 49-page, pocket-size pamphlet describes the application, chemical analysis, and mechanical properties of G-E welding electrodes. The booklet is designated GED-1634.

FORK LIFT TRUCKS: "How to Operate a Lift Truck" is a 24-page manual for use in training fork lift truck operators and is published by Hyster Co.,

OCTOBER 27, 1952



NA-3A VHF NAVIGATION SYSTEM

Now in Production for the World's Airlines

The Bendix MN-85D VHF Receiver, pictured above, is the heart of the NA-3A Navigation System. It combines unexcelled performance with simplicity of design and ease of maintenance.

Finger-tip selection
of 200 crystal-controlled localizer, VAR, VOR, and civil aviation communication channels.



Picture navigation
with the Bendix Radio Omni-Mag, a simple indicator which provides selection of course line and automatically shows aircraft position and heading deviation from that line.



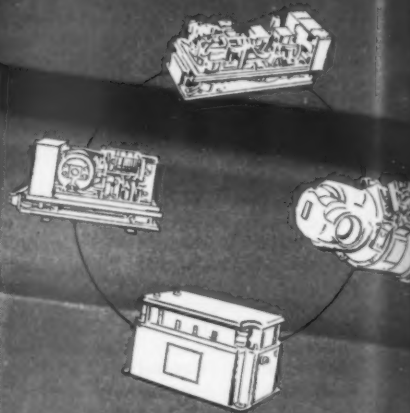
BENDIX RADIO DIVISION of
BALTIMORE 4, MARYLAND



Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, New York
Canadian Distributor: Radio Engineering Products, Ltd., 4305 Iberville Street, Montreal, Quebec.

TOMORROW'S AIRCRAFT:

**"Airborne
electrical systems
are subject to
severe demands"**



The current standardization work on a-c control panels is the latest development by Westinghouse in aircraft electrical systems. This development is aimed toward an automatic control system, including paralleling and synchronizing of the generator. These automatic systems will be particularly valuable for aircraft having a limited crew—and will ease crew duties and provide more reliability.

Imag
tank
degre
Whe
Fina
load
requi
house
had t
Fo
ing h
tinuit
pione

Basic
Turbo
Radar
Equip
Groun
Wind
ustria

One step closer

Imagine an electrical system where circuits are next to a tank car of gasoline! Where temperatures range from 160 degrees to minus 67 degrees F and change rapidly. Where the whole system is subject to vibrational stresses. Finally, add routine functions of accommodating sudden load changes, system surges, and of meeting switching requirements. These are the severe problems that Westinghouse designers of modern aircraft power systems have had to overcome.

For more than 36 years, Westinghouse has been producing high-quality a-c and d-c equipment to provide continuity of service for aircraft. In fact, Westinghouse pioneered the research, development, and production of

a-c systems . . . alternators that provide power to start engines, operate pumps for heating and ventilating, flight control, lighting, and electronic devices. And to complete the electrical system Westinghouse also supplies regulators, breakers, generators, control panels, motors, hoists, rectifiers and transformers. All these products have been tried, tested, proved by millions of airborne kilowatt-hours.

You'll find this same background of research, development, and experience in the Westinghouse approach and solution to many current aviation problems. Call your Westinghouse office, or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa. J-91001

THE SCOPE OF WESTINGHOUSE IN AVIATION

Basic aircraft systems

Turbojet Engines, Fire Control, Radar, Autopilots, Communication Equipment and Electrical Systems.

Ground equipment

Wind Tunnels, Airport Lighting, Industrial Plant Apparatus.

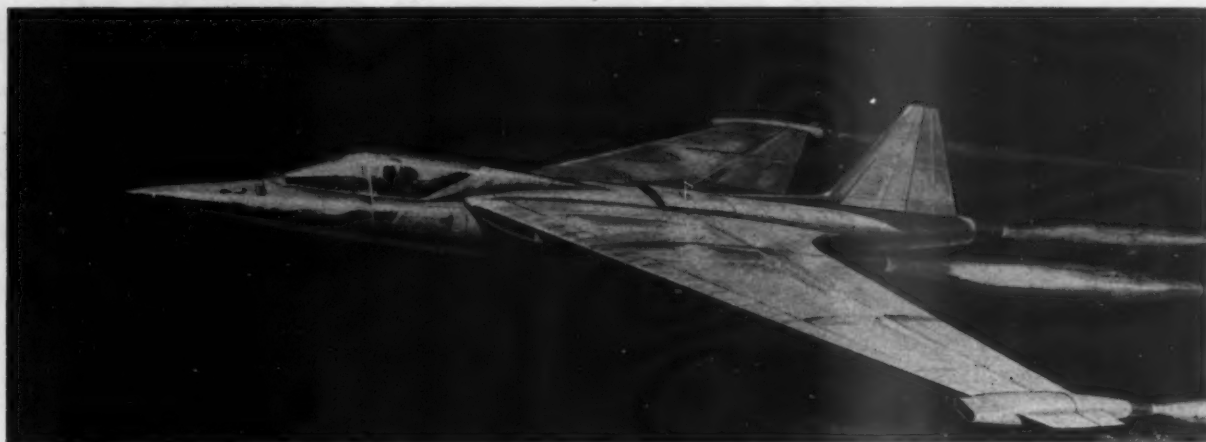
Airborne system components

Transformers, Rectifiers, Instruments, Gyro-motors, Temperature Control Panels, Generating Equipment and System Controls, Circuit Breakers, Contactors, Motors, Actuators and Hoists, Electronic Tubes, Magamps, Micarta®.

YOU CAN BE SURE...IF IT'S
Westinghouse



Production Spotlight



Tomorrow: Glass may be the answer to the question of what materials will successfully resist the heat generated by high-speed aircraft. In the artist's conception above, presented by Northrop Aircraft, the airplane has glass wings, glass ailerons, glass stabilizers, and an all-glass fuselage. It is fastened with glass rivets, and might better 2,000 mph.

Convair to Build Delta Fighter

Three prime airframe builders have received military contracts for new planes and the Air Force has increased its orders for two bombers already in production.

- **North American Aviation** received a Navy order for T-28B basic trainers, a craft which will differ from the Air Force's T-28A in that it will be powered by a Wright R-1820 1,425-hp engine instead of the Wright R-1300 800-hp power plant. This change will add 60 mph to the trainer's top speed and 1,200 feet to the service ceiling. The T-28B's performance will be a 343-mph top and a 37,700-foot ceiling.

- **Consolidated Vultee** has obtained its first production contract for a fighter plane since before World War II in the USAF request that it produce a substantial number of F-102 radar-interceptors. The F-102, an advanced version of Convair's delta-wing XF-92A, will be a supersonic, single-seat interceptor carrying not only conventional high-velocity rockets but also the Hughes F-98 Falcon, an air-to-air guided missile recently ordered into production. The F-102 will be produced at San Diego.

- **The Glenn L. Martin Co.** was awarded a Navy development contract for a "radically different" high-speed jet seaplane designated only as the Model 275 Seamaster. It is understood

to be a heavy multi-engine aircraft in the general patrol bomber category and will probably be used for mine-laying and other special operations.

Martin has also obtained a second production order from the Air Force for its B-57A Canberra. The company will also soon be told to build a reconnaissance version of the English-Electric-licensed plane, to be known as the RB-57B.

More B-47's

- **Boeing Airplane Co.**, which, AF Under Secretary Roswell L. Gilpatric disclosed, has already turned out more than 300 Stratojets at Wichita, has received a letter of intent for added production of the B-47. This new contract is expected to keep Wichita busy on B-47's until the middle of 1955.

The Navy order for T-28B's, incidentally, marks the inception of a new method of designating military aircraft. Hereafter, when one branch of service decides to order a plane developed by another branch, the original designation will be retained. Thus, for example, if the Air Force should decide to order a Navy plane like the Cutlass, it would be called the F7U by the USAF. Conversely, if the Navy decided it wanted the F-100, Bureau of Aeronautics officials would call it the F-100 as well.

Aro Contract till March; New Director Named

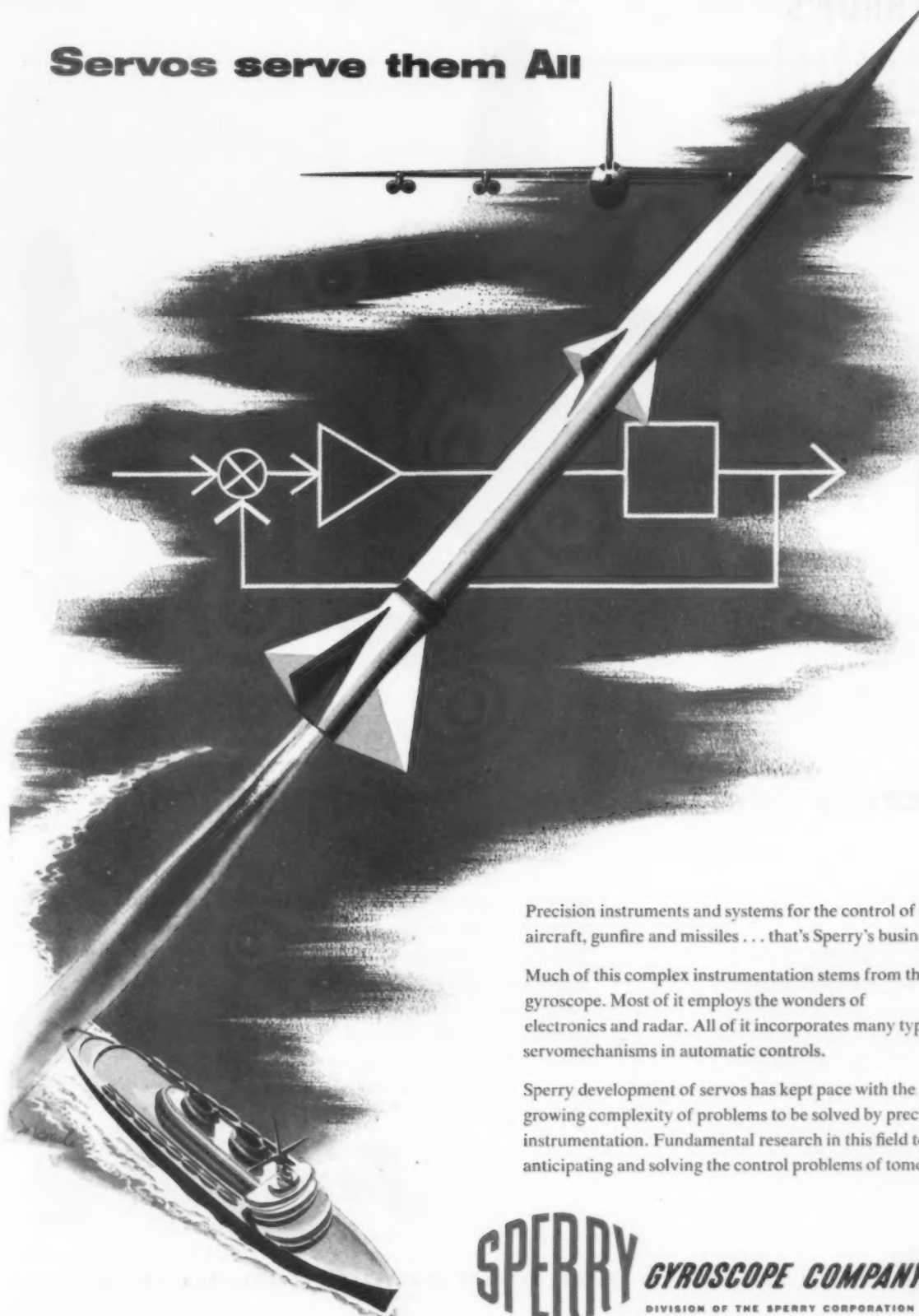
The wind tunnel at the Arnold Engineering Development Center at Tullahoma, Tenn., will be operated by Aro, Inc., until next March 1 under the terms of a new USAF contract providing for an estimated cost of \$2,427,880 and a fixed fee of \$55,000.

Aro, a subsidiary set up by Sverdrup & Parcel of St. Louis to manage the test facility built for the Air Research and Development Command, was strongly criticized during Congressional hearings on the 1953 appropriations bill. Its former director of administration, Stephen F. Leo, one-time director of public relations for the Air Force, has been replaced by James W. Gaynor, assistant to managing director Thomas F. Farrell, and has returned to the parent firm as a vice president.

New Hiller Firm

The president of Hiller Helicopter, Palo Alto, Calif., Stanley Hiller, Jr., has created a new firm at San Mateo called Hiller Engineering Corp. to produce a non-aviation product. R. Y. Dakin, formerly of Pacific Helicopter Co., Hiller distributor in Los Angeles, is associated with Hiller in the new venture.

Servos serve them All



Precision instruments and systems for the control of ships, aircraft, gunfire and missiles . . . that's Sperry's business.

Much of this complex instrumentation stems from the gyroscope. Most of it employs the wonders of electronics and radar. All of it incorporates many types of servomechanisms in automatic controls.

Sperry development of servos has kept pace with the growing complexity of problems to be solved by precision instrumentation. Fundamental research in this field today is anticipating and solving the control problems of tomorrow.

SPERRY *GYROSCOPE COMPANY*
DIVISION OF THE SPERRY CORPORATION

GREAT NECK, NEW YORK • CLEVELAND • NEW ORLEANS • LOS ANGELES • SAN FRANCISCO • SEATTLE • BROOKLYN
IN CANADA • SPERRY GYROSCOPE COMPANY OF CANADA LIMITED • MONTREAL QUEBEC

NORTHROP'S F-89D



to carry Janitrol specialized equipment

*aircraft heaters
thermal anti-icing equipment
inert gas generators
liquid or coolant heaters
portable ground heaters
trailer heaters
heat exchangers*

Among up-to-the-minute advancements on Northrop's latest version of the "Scorpion" all-weather interceptor-fighter is the addition of Janitrol specialized equipment. Jet power—the destructive punch of rockets—pinpoint accurate aiming and firing equipment—radar search eyes—and the new factor of safety added by Janitrol, help make the newest "Scorpion" a finer weapon for the Air Forces . . . and another example of Janitrol combustion engineering in action—wherever aircraft make news.

Janitrol



AIRCRAFT-AUTOMOTIVE DIVISION, SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO

F. H. Scott, 225 Broadway, New York, N. Y. • C. B. Anderson, 2509 W. Berry St., Ft. Worth, Tex. • L. A. Curtin, 7046 Hollywood Blvd., Hollywood, Calif. • F. H. Scott, 4650 East-West Highway, Washington, D. C. • Phil A. Miller, Frank Deak, USAF Coordinator, Central District Office, 400 Dublin Ave., Columbus, Ohio • Headquarters, Toledo Ohio

Valves



MOTOR OPERATED gate valve manufactured by Hydro-Aire, Inc., features manual override of new design, light weight, and compact construction. Use of Teflon, which offers high fuel resistance, eliminates rubber or synthetic rubber throughout assembly. Limit switch operation is said to be virtually foolproof.

(121*)



● FUEL LEVEL CONTROL VALVE

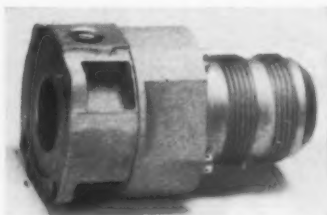
Manufacturer: The Parker Appliance Company

Model: Various

Weight: 1.0 to 1.8 lbs.

Dimensions: 1½" to 2" dia.

General: A tank-mounted fuel level control valve of the integral pilot type capable of handling pressures up to 75 psi. (122*)



● FUEL CHECK VALVE

Manufacturer: Kohler Company

Model: K 1332-X4

Weight: .1602 lbs.

Dimensions: 4½" overall

General: A swing type check valve for use in aircraft fuel systems to prevent back flow. (123*)



● FUEL SHUT-OFF VALVE

Manufacturer: The Parker Appliance Company

Model: 4115D

Weight: 1 lb.—2.8 lbs.

General: Available in sizes from ¼" to 1½". The 4115D fuel shut-off valve is an electrically operated unit of two-port construction requiring 10-20 in.-lbs. torque for actuation. This torque is provided by a Geneva-Loc electric actuator. (124*)

* For more information see pages 5 and 6.



● FUEL CHECK VALVE & FLOW INDICATOR

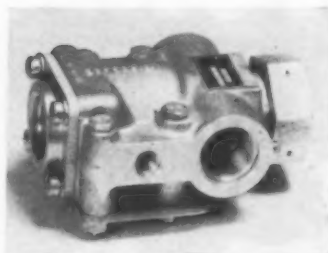
Manufacturer: The Aerotec Corporation

Model: B 20004 RW

Weight: 1.25 lbs.

Dimensions: 6.27" x 3¼" x 2¾"

General: Used in aircraft fuel transfer systems, the B 20004 check valve and flow indicator opens at flow of 400 lbs./hr. maximum on increasing pressure and closes at flow of 100 lbs./hr. minimum on decreasing pressure. (125*)



● FUEL DUMP VALVE

Manufacturer: Kohler Company

Model: 61F-368-1

Weight: .3202 lbs.

Dimensions: 5" overall

General: An electrically actuated fuel dump valve for remote installations. (126*)



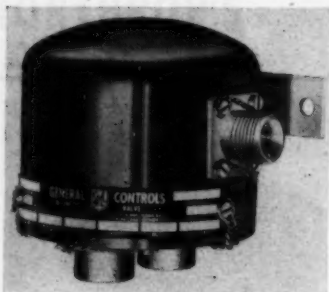
● FUEL FILLER VALVE

Manufacturer: The Parker Appliance Company

Model: A-1

Capacity: 600 gpm

General: A fuel filler cap for use with aircraft having single point fueling systems. (127*)



* For more information see pages 5 and 6.

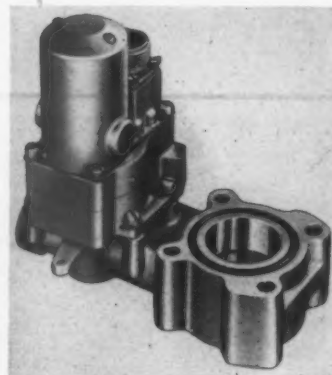
● MAGNETIC VALVE

Manufacturer: General Controls Company

Model: AL-58K

Dimensions: 3" dia. x 3"

General: An all-metal pressure control suitable for gauge pressure or differential pressure applications, the AL-58K magnetic valve is suitable for use with any fluids, not corrosive to copper or bronze alloys and synthetic rubber static seals. Available either as general-purpose type or hermetically sealed with electrical contacts normally closed, normally open or double throw. (128*)



● GATE VALVE

Manufacturer: General Controls Company

Model: AV-16B

Weight: 1.2 lbs. and up

Dimensions: 1.99" x 2.17" x 5.19"—5.00" x 4.31" x 5.95"

General: A motor-operated gate valve using 24-28 volt d-c, the AV-16B provides a shut-off control for high flow capacity systems, including fuel, oil, air, water, alcohol, and coolants. Usable with operating pressures ranging from 0 to 100 psi, it is designed to operate in 1/2 to 1 second on sizes up to 2", and 1-2 seconds on sizes over 2". One-piece aluminum body construction eliminates leakage through gasket and body joints. (129*)

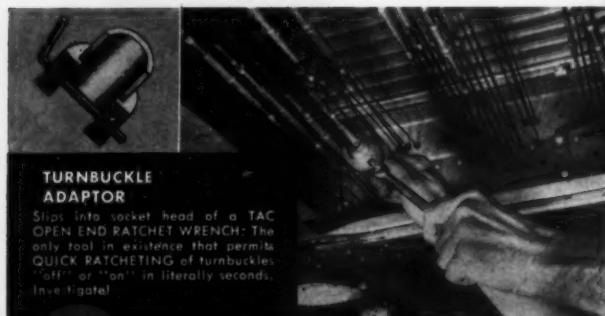
SAVE A FORTUNE

- IN TIME
- TOOLS and
- TUBING

OPEN END RATCHET WRENCH PROVIDES THE ANSWER FOR RESTRICTED SPACE IN AIRFRAME, ENGINE OR CONTROL ASSEMBLIES

WRENCHING OPERATIONS are production line headaches in crowded aircraft plumbing—tubing, conduit, piping, cable or other standing center connections. TAC's OPEN END RATCHET WRENCH slips over tubing, tightens or backs off fittings, slips off again—all in an incredible fraction of the time required by conventional wrench designs. Ratchets in as little as 7° are of clearance! A clean connection that can't bend or "bark" even softest copper tubing.

With 64 socket sizes and numerous adaptors, the TAC wrench has been termed "A whole hand tool crib under one head." NOW DELIVERING this phenomenal tool in quantity.



TURNBUCKLE ADAPTOR

Slips into socket head of a TAC OPEN END RATCHET WRENCH. The only tool in existence that permits QUICK RATCHETING of turnbuckles "off" or "on" in literally seconds. Inevitigat!



Over the Tubing



Down on the Fitting

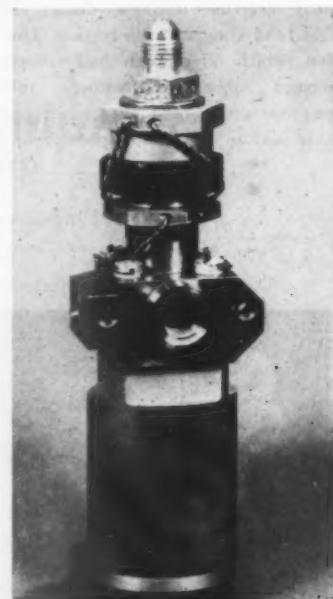


Now Ratchet!

SEND FOR CATALOG AND FULL DATA

Facts concerning spanner, aircraft engine Push Rod Housing, Allen Head and other adaptations of the TAC open end ratcheting PRINCIPLE.

TUBING APPLIANCE COMPANY
10321 Anza Avenue, Los Angeles 45, Calif.



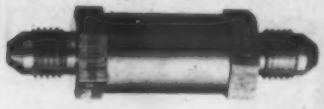
● THERMAL RELIEF VALVE

Manufacturer: The Aerotec Corporation
Model: 710-Z

Weight: 1.04 lbs.

Dimensions: 1.82" x 2.25" x 5.39"

General: A pneumatic reducing and shut-off valve, the Model 710-Z has a regulating range of 5-100 psi inlet pressure. (130*)



● **RELIEF VALVE**

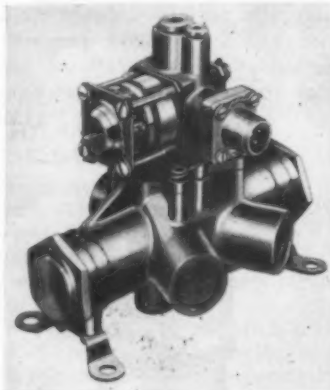
Manufacturer: Allen Aircraft Products

Model: 4P10

Weight: 0.07 lbs.

Dimensions: 0.688" dia. x 2.63"

General: One of a complete series of Allen relief valves covering a wide range of pressure & flows. (131*)



● **SELECTOR VALVE**

Manufacturer: General Controls Company

Model: AV-13A

Weight: 1.4—3.0 lbs.

Dimensions: 3.12"—4.63" high

General: Designed for use in high pressure, high-flow hydraulic systems, the model AV-13A is an electro-magnetic slidetype three-way selector valve. Operating from 24-28 volts d-c, the two-position valve is designed for operating pressures ranging from 150 to 3,000 psi. Manual override and/or thermal relief positions are available as optional features; the same valve of poppet type design is identified as the AV-13B. (132*)



● **PNEUMATIC CHECK VALVE**

Manufacturer: Kohler Company

Model: K-1353-6

Weight: .202 lbs.

Dimensions: 2 7/8" overall (133*)

* For more information see pages 5 and 6.

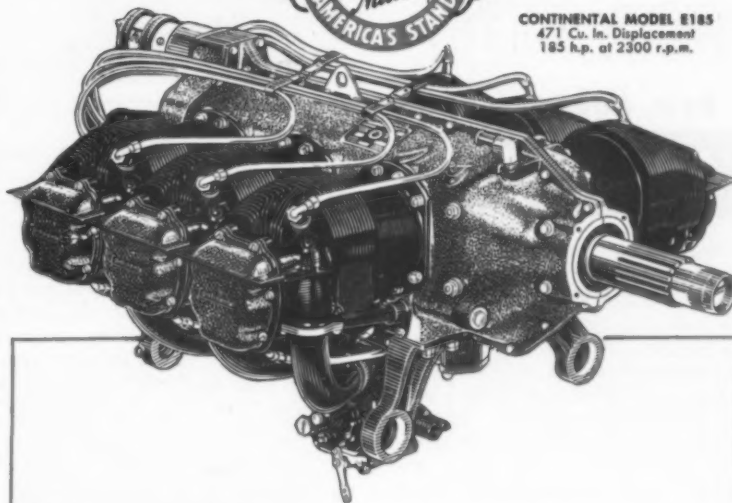
CONTINENTAL

AIRCRAFT ENGINES

ARE STANDARD IN MOST OF TODAY'S UTILITY PLANES



CONTINENTAL MODEL E185
471 Cu. In. Displacement
185 h.p. at 2300 r.p.m.



IT IS a tribute to the quality of Continental engines, as well as to the judgment of corporate and individual owners of utility type planes, that an overwhelming majority of such planes in use today fly with dependable Continental Red Seal power.

REMEMBER, CONTINENTAL BACKS YOU WITH SERVICE

WHEREVER YOU FLY

Continental Motors Corporation

Aircraft Engine Division

MUSKEGON, MICHIGAN



ONE-MAN OPERATION

TEX-MET's

new, lightweight

CARGO-CART

Here's the ideal luggage cart for small airline operation stations... lots of storage area...lots of maneuverability...but *little weight!* Aluminum channel frame with oak flooring and strong bumpers make Tex-Met's Cargo-Cart easy for one man to operate. Strong and sturdy, it's low in cost...low in maintenance...but high in service and convenience.

Tex-Met's Cargo-Cart



Holds up to 1,200 pounds of luggage



Has positive action brakes, controlled by handle



Is easily loaded and unloaded — floor is 19" from ground — overall size, 76" long, 36" wide



Has four 12" wheels with zero pressure rubber tires for easy handling.

Train towing units with greater load capacities also available.

Write today for illustrated literature and prices

TEX-MET

TEXAS METAL & MFG. CO., INC.

6114 Forest Park Road • Dallas, Texas
Cargo Carts • Nose Loading Stands • Pickling Carts
All Types of Ground Servicing and Maintenance Equipment for the Aviation Industry.



● VENT VALVE

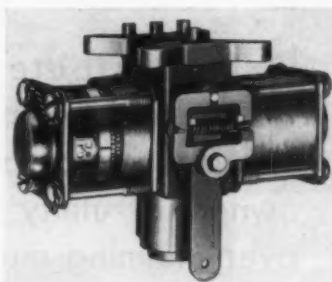
Manufacturer: The Aerotec Corp.

Model: B-18002

Weight: 0.8 lb.

Dimensions: 5-15/16" x 2 3/4" dia.

General: A pressure and vacuum relief vent valve, B-18002 is used to provide accurate control of ram air pressure to fuel tank. Actuating pressures range from $2 \pm 1/4$ psi for the pressure relief valve and 3.5" H₂O for the vacuum relief valve. (134*)



● PILOT VALVE

Manufacturer: General Controls Company

Model: AV-14G

Weight: 0.9—1.6 lbs.

Dimensions: 3.23" to 4.44" high

General: Designed for use in high-pressure hydraulic systems the AV-14G is a 3-position, 4-way pilot valve for use in 24-28 volt d-c applications with operating pressures ranging from 0-3,000 psi. (135*)

* For more information see pages 5 and 6.



● HYDRAULIC VALVE

Manufacturer: Aeroguild, Incorporated

Model: 790

Weight: 9.7 lbs.

Dimensions: 1.25" x 1.69" x 5.56"

General: A spring-loaded, hydraulic shuttle valve, the Model 790 is usable in hydraulic systems of 3,000 psi range. The valve is designed for use with 3,000-lb. hydraulic pressure at the main port and 2,000-psi pneumatic pressure at the emergency port. (136*)



● SHUT-OFF VALVE

Manufacturer: General Controls Company

Model: AV-9

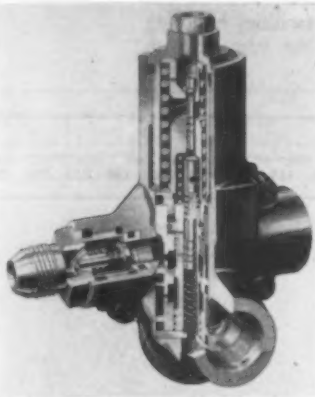
Weight: 1.5—2.0 lbs.

Dimensions: 6.24"—6.71" ht.

General: Designed for hydraulic oil and other pressurized liquid or high temperature pneumatic systems, the AV-9 pilot-operated electro-magnetic shut-off valve is available in the normally opened or normally closed types. Operating pressures in variations up to 3,000 psi's are accommodated. (137*)

AMERICAN AVIATION

Hydraulics



● HYDRAULIC PRESSURE REGULATOR

Manufacturer: Vickers, Inc.

Model: AA-34500

Weight: 2.8 lbs.

Dimensions: 5 15/16" high x 3 27/32"

General: A hydraulic pressure regulator for use in 3,000 psi hydraulic systems, the model AA-34500 regulator is rated at 16 gpm and can be adjusted to cut-in and cut-out pressures ranging from 1,200 psi to 3,100 psi. Model AA-14500, also available, is rated at 10 gpm and is adjustable in the range from 600 to 1,400 psi. (138*)



● ACCUMULATORS

Manufacturer: Parker Appliance Co.

Model: Cylindrical

General: Typical Parker cylindrical accumulator such as used for U. S. Navy aircraft. Of dual shell construction diameters range from 2 13/16" to 5 1/2" and lengths from 12 1/2" to 36 1/8". Weights range from 3.8 lbs. to 29.5 lbs. (139*)

● HYDRAULIC ACCUMULATORS

Manufacturer: Vickers, Inc.

Model: AA-14310

Weight: 33 lbs.

Dimensions: 11 1/4" dia. x 11 15/16" long

General: One of a series of three standard Vickers accumulators available in 5", 7 1/2", and 10" sizes, the model AA-14310 is a 10" accumulator designed for use in 3,000 lb. hydraulic systems. (140*)

● HYDRAULIC PUMP

Manufacturer: The Denison Engineering Co.

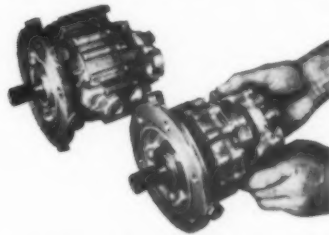
Model: AP 3V-11

Weight: 14.2 lbs.

Dimensions: 6 3/4" x 8 3/8" x 6 1/8" x 6 5/8"

Output: 3 gpm at 3,000 psi at 1,500 rpm.

General: A new type variable displacement hydraulic pump designed to military specification P-7740. (141*)



● HYDRAULIC PUMP

Manufacturer: The Denison Engineering Co.

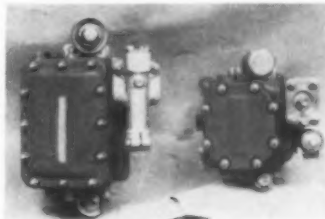
Model: AP3G9

Weight: 10 lbs.

Dimensions: 6 1/4" x 7 3/4" x 6" x 6 1/8"

Output: 3 gpm at 1,500 rpm at 5,000 psi.

General: A new type aircraft hydraulic pump of constant volume for the standard AND20002 type drive. (142*)



LIGHTWEIGHT hydraulic pump of Vickers design shown here is compared with predecessor Model 909 pump. Of variable displacement type, the new Model 909 pump weighs 8.7 lbs., representing 68% of the previous design. A .367 cu. in. pump, it represents the first redesign of Vickers complete line of variable displacement pumps ranging in size from .049 to 3.67 cu. in. displacement. (143*)

● HYDRAULIC RELIEF VALVES

Manufacturer: Vickers, Inc.

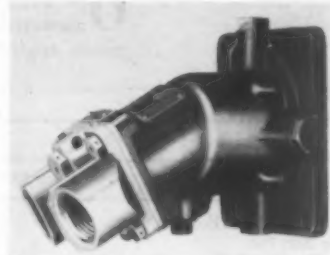
Model: AA-31300

Weight: 3/4 lb.

Dimensions: 4 1/4" high x 2 1/8" overall

General: Typical of a series of Vickers high pressure hydraulic relief valves with rated capacities ranging from 2 to 24 gpm. Vent feature can be provided to control valve from an outside source. (144*)

* For more information see pages 5 and 6.



● HYDRAULIC PUMP

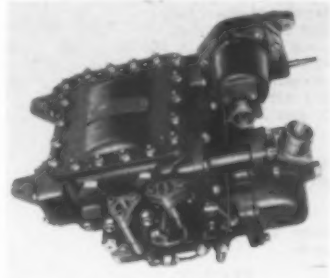
Manufacturer: Vickers, Inc.

Model: PFA3Y-2

Weight: 8.4 lbs.

Dimensions: 6" dia. pad x 6 7/64" overall

General: A fixed displacement hydraulic pump rated at 3,000 psi with a capacity of 3 gpm. Conforms to Spec. AN 4149. Other models include PFA4Y rated at 4 gpm capacity and PFA5Y rated at 5 gpm. The AN Series supplements Vickers Standard line of 32 variable displacement pump sizes. (145*)



● SERVO PUMP

Manufacturer: Vickers, Inc.

Model: E-9536

Weight: 14 1/2 lbs.

General: An electrically controlled variable delivery hydraulic pump, the model E-9536 pump combined with a linear or rotary hydraulic motor forms a complete hydraulic transmission for such applications as high response surface control operation. (146*)

● HYDRAULIC MOTOR

Manufacturer: Vickers, Inc.

Model: MF-3911

Weight: 6.29 lbs.

Dimensions: 4 1/2" pad x 5 1/2" overall

General: Typical of a series of Vickers hydraulic motors, the model MF-3911 is rated at 0.6 cu. in. capacity with some models delivering as much as 2.5 hp per pound. Available in 32 standard sizes with theoretical torque ratings ranging from 31 lbs. to 2629 lbs./in. (147*)

Ov

ON THE FOLLOWING pages are listed CAA approved repair stations that answered AMERICAN AVIATION's survey of engine overhaul facilities handling piston engines. While it is not all inclusive, it does provide the core of such

	125	145	W
10	10	10	
11	11	11	
12	12	12	
13	13	13	
14	14	14	
15	15	15	
16	16	16	
17	17	17	
18	18	18	
19	19	19	
20	20	20	
21	21	21	
22	22	22	
23	23	23	
24	24	24	
25	25	25	
26	26	26	
27	27	27	
28	28	28	
29	29	29	
30	30	30	
31	31	31	
32	32	32	
33	33	33	
34	34	34	
35	35	35	
36	36	36	
37	37	37	
38	38	38	
39	39	39	
40	40	40	
41	41	41	
42	42	42	
43	43	43	
44	44	44	
45	45	45	
46	46	46	
47	47	47	
48	48	48	
49	49	49	
50	50	50	
51	51	51	
52	52	52	
53	53	53	
54	54	54	
55	55	55	
56	56	56	
57	57	57	
58	58	58	
59	59	59	
60	60	60	
61	61	61	
62	62	62	
63	63	63	
64	64	64	
65	65	65	
66	66	66	
67	67	67	
68	68	68	
69	69	69	
70	70	70	
71	71	71	
72	72	72	
73	73	73	
74	74	74	
75	75	75	
76	76	76	
77	77	77	
78	78	78	
79	79	79	
80	80	80	
81	81	81	
82	82	82	
83	83	83	
84	84	84	
85	85	85	
86	86	86	
87	87	87	
88	88	88	
89	89	89	
90	90	90	
91	91	91	
92	92	92	
93	93	93	
94	94	94	
95	95	95	
96	96	96	
97	97	97	
98	98	98	
99	99	99	
100	100	100	

Overhaul Facilities Including Flow Time

facilities along with data on the types of engines for which each shop is equipped and, in most cases, the approximate flow time in days through the shop.

Warner				Franklin									Jacobs			Pratt & Whitney								Wright				Ran- ger
125	145	165	213	6A4	6A8	6V4	65	80	150	165	213	LAMB	225	755	450	985	1340	1830	2000	2180	2800	4360	975	1300	1820	3350	6-440	
..	35	35	35	35	35	..	35	..	35	35	..	35	..	..	..	..	..	..	..	..	..	..
..	5	5	5	..	..	..	..	..	..	..	..	..	8	6	10	10	..	12	..	..	..	..	..	..	5
..	37	37	37	..	..	37	..	..	..	..	..	..	..
..	30	30	30	30	..	30	..	..	..	..	30	30	..
..	†	†
..	30	30	30	30*	..	30*	..	..	..	..	..	..	..
..	30	30	30*	..	..	..	..	..	..	..	..	..	..
..	†	†	†	†	†	†
..	†	†	†	†	..	†	..	†	..	†	†	†	..
..
†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
10	10	10	10	10	10	10	..	..	..	..	..	10	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	23	26*	..	21*	31	..	..	..	..	..	..
..	30	..	..	30	..	..	..	..	..	..	..
..	†	†	†	†	†	†	†	†	†	†	†	†
..	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
..	14	14	16	16	21	21	..	..	..	..	..	..	..
..	42	..	..	49	..	..	..	10	..	..	..
..	15	20	20	..	..	..	17	..	..
..	21	21	21	..	..	21	..	..	..	..	..	..	..
..	14	..	20	..	..	..	10	19	..	..
..	20	..	..	..	..	..	10	†	..	..
..	4	5	..	7	..	..	..	..	..	..	..
..	14	..	..	..	..	..	..	..	..	..	..	..	..
..	†	†	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	†
..	45	45	..	..	..	..	..	..	45	..	..	..	..
..	10	10	10	10	10	10	10	10	10	10	10	..	†	..	..	..	..	..	..	..	..	..	..	..	†
..	†

125

Warner				Franklin								Jacobs			Pratt & Whitney								Wright				Ran-ger	
125	145	165	213	6A4	6A8	6V4	65	80	150	165	213	L4MB	225	755	450	985	1340	1830	2000	2180	2800	4360	975	1300	1820	3350	6-440	
14	14	14	14	14	14	14	14	14	14	14	14	14	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14
..	14	14	14	14	14	14	14	14	14	14	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	4	..	..	4	4	4	4	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	†	†	†	..	20	30	†	..	..	†	..	..	†	†	..	..	..
..	7	..	..	..	..	7	7	..	10	..	..	..	10	12	..	..	..	18	..	..	..	..	..	..	..
†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
..	10	..	..	..	..	..	..	..	..	..	..	..	..
..	†	†	†	†	†	†
..	6	6	6	6	6	6	6	6	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	7	21	..	
..	10	..	20	30	..	..	..	..	..	..	..
..	11	..	..	11	..	..	..	..	..	..	..
..	17	17	17	17	..	..	..	..	..	17	..	..	..
..
..	7	..	..	7	7	7	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	10	10	..	..	..	..	..	..	..	..	..
..	45	45	45	45	45	..	..	..	..	45	..	..	..
..	7	..	..	..	..	..	..	..	..	..	..	..	..
..	10	..	10	10	16	16	..	..	..	..	16	..	..	..	..	..
..	14	16	..	19	..	..	..	..	..	..	..
..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	25	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	35	35	35	..	35	35	35	35	..	..	..	..	..	..	..	..	..
..
..
..
..	20	..	20	..	..	..	..	..	..	20	..	..	..
..	21	..	..	..	..	..	..	28	..	
..	42	42	42	..	..	..	..	..	..	..	..
..	35	35	35	35	35	..	..	..	..	35	..	..	..

Electrical Accessories

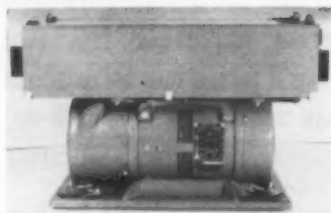
Unit Name	Mfr.	Model	General Type	Wt.	Rating	Dimensions Length-Width-Height	Range	Remarks
Relay	AECO		20	3 oz.	20-26 or 115 v	2 1/16" x 1 1/8" x 1 1/16"		400 cycle
"	"		SQA	1 3/4 oz.	up to 115 v d-c	1 3/8" x 1 1/8" x 1 3/8"		
"	"		SQD	2 oz.	"	1 1/8" x 1" x 1 3/8"		
"	"		"S" Power type	12 oz.	"	1 3/8" x 1 3/8" x 1 1/2"		Contacts rated at 25 amps. at 24 v d-c
Stepping switch	"		Type 44 stepping switch		"	4 1/8" x 1 57/64" x 2 1/8"		
Relay	"		"AN"		24 v d-c	AN-3303-1 & AN3304-1		
Tele. type relay	Potter & Brumfield	MHD	MH Series	1 3/4 oz.	d-c coils to 4 oz.	3/4" x 1 1/8" x 1 1/8" long	up to 230 v. d-c	
"	"	MHL	" "	"	Sensitive up to 23,000 ohms	"	50 milliwatts per movable spring	
"	"	MHA	" "	"	a-c coils	"	up to 230 v a-c (60 cycles)	
Super midget relay	"	SM5L	Super (SPDT) midget serels	1/2 oz.	d-c only	5/8" dia. by 1 1/8" long	10,000 ohm coil	75 milliwatt sensitivity
"	"	SM5D	" "	"	"	"	70 v. d-c	1/2 watt sensitivity
"	"	SM5LS	Same as above except hermetically sealed with 7 pin plug in base.					
"	"	SM5DS						
Relay	"ADVANCE"	AN3308-1	Sealed	1/2 lb.	24 v d-c	2" x 1 1/8" x 3 3/8"		3P-DT 10 Amp.
"	"	AN3304-1	"	3/5 lb.	"	1 5/8" x 1 7/8" x 2 3/8"		4P-DT 3 Amp.
"	"	AN3310-1	"	3/4 lb.	"	2" x 1 3/4" x 3 1/8"		4P-DT 10 Amp.
Under frequency relay	Varo Mfg. Co.	9101	SPDT	1 3/4	1.5 amps.	4" x 7" x 2"	300 to 1000 cps	Electronic
"	"	9111	"	2	"	4" x 7" x 2"	"	"
Over frequency relay	"	9121	"	1 3/4	"	"	"	"
"	"	9131	"	"	"	"	"	"
Over voltage	"	9211	"	"	"	"	"	"

Mercury Thermostat Switches

Unit	Manufacturer	Housing	Mounting	Weight	Overall Length	Description	Tube
Thermostat cabin	Vapor Corp.	Heating	Type 1	Wall plug-in	.12 lb. (approx.)	4.75"	Cabin temp. sensing R1
Thermostat cabin	Vapor Corp.	Heating	Type 8	Bracket, top AN connector	.312 lb. (approx.)	7.5"	Cabin temp. sensing or wattage reg. R2, R4, W1
Thermostat duct	Vapor Corp.	Heating	Type 2	Circular flange	.15 lb. (approx.)	7.0"	Anticipator or compensator R1, S1
Thermostat duct	Vapor Corp.	Heating	Type 11	Circular flange, angle AN connector	.30 lb. (approx.)	7.0"	Anticipator or compensator R1
Thermostat immersion	Vapor Corp.	Heating	Type 6	1"-14 threads, top AN connector	.41 lb. (approx.)	7.0"	Liquid temp. sensing R2
Thermostat immersion	Vapor Corp.	Heating		3/8"-18 N.F. threads	.140 lb. (approx.)	5.718"	Liquid temp. sensing 12S1



ELECTRICAL



● INVERTER

Manufacturer: Holtzer-Cabot

Model: MG-244

Weight: 42 lbs.

Dimensions: 13 13/16" x 6 7/8" x 10 17/32"

General: Operating on 27.5 volts input this inverter produces 3 phase 400 cycle 115/200 volt output with a power factor of 9, plus single phase 400 cycle 115 volt output. (148*)



● AIRCRAFT BATTERY

Manufacturer: Willard Storage Battery Co.

Model: AW-12-36

Weight: 34 lbs.

Dimensions: 10" x 5 1/4" x 10 3/4"

General: A 12 volt battery for personal aircraft with 36 ampere/hour capacity at the 5 hour rate. Features manifold vent with battery fumes exhausted outside aircraft. Suitable for use in enclosed battery boxes. (151*)



● RHEOSTAT

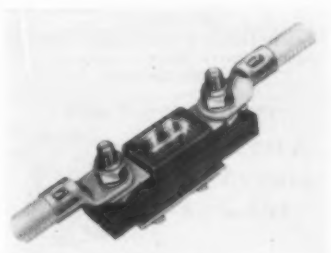
Manufacturer: Ohmite Mfg. Co.

Model: AN 3155-25

Weight: 0.3 lbs.

Dimensions: 1 7/8" dia. x 3 1/8" overall

General: One of a series of Ohmite rheostats with ratings from 25 to 1,000 watts. (153*)



● AIRCRAFT LIMITER

Manufacturer: Burndy Engineering Co., Inc.

Model: FLL

Weight: 3-5 lbs./100

Dimensions: 2 7/16" x 7/8" x 3/8"

General: Typical of a series ranging from 35 to 500 ampere ratings. (149*)



● AIRCRAFT BATTERY

Manufacturer: Electric Storage Battery Co.

Model: 6-FH-13

Weight: 78 lbs.

Dimensions: 13 15/16" x 7 1/4" x 10 13/16"

General: A standard 12 volt transport aircraft battery with 5 hour/88 ampere hour capacity. Two batteries are used in series for 24 volt electrical systems. (152*)



● RELAY

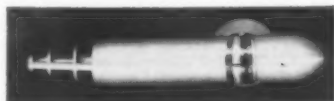
Manufacturer: Advance Electric & Relay Co.

Model: AN 3303-1

Weight: 1/2 lb.

Dimensions: 1 1/8" x 1 13/32" x 3"

General: A four-pole, double-throw sealed relay 10 amp. capacity for 28 volt systems. (154*)



CABIN THERMOSTAT manufactured by Vapor Heating Corp. for use in aircraft heating systems. Uses a mercury tube containing a double mercury bulb and multiple contacts as a switching mechanism to control heater operation or duct damper positions. (150*)



● ELECTRICAL TERMINAL

Manufacturer: Burndy Engineering Co.

Model: AN-659

General: Typical of a series of Burndy terminals for wires ranging from No. 22 to No. 4/0 sizes. (155*)

Temperature & Pressure Instruments

Unit Name	Model	Mfr.	Wt.	Range	Dimensions	Type Face	Power Req.	Single or Dual Type
Thermocouple temperature indicator	17B	Lewis Engineering Co.	17 oz.	All standard ranges	3" size	Dial	Millivolts To BU Stds Tables	Single
Thermocouple temperature indicator	76B	Lewis Engineering Co.	22 oz.	"	3" size	"	"	Dual
Thermocouple temperature indicator	149B	Lewis Engineering Co.	9 oz.	"	2" size	"	"	"
Resistance thermometer	46B	Lewis Engineering Co.	14 oz.	"	2" size	"	28 volts	"
Resistance thermometer	47B	Lewis Engineering Co.	11 oz.	"	2" size	"	"	"
Resistance thermometer	77B	Lewis Engineering Co.	20 oz.	"	3" size	"	"	Dual
Resistance thermometer	147B	Lewis Engineering Co.	11 oz.	"	2" size	"	"	Single
Thermocouples		Lewis Engineering Co.		Cylinder head; Jet exhaust	Used as sensing elements for thermocouple thermometers			
Resistance bulb	A-N and MIL types	Lewis Engineering Co.		Free-air, oil, carb-air, etc.	To spec.	Used as sensing elements for resistance thermometers		
Thermocouple lead-wire		Lewis Engineering Co.		Used to connect thermocouples with thermocouple thermometer				
Resistor box	AN5534-1	Lewis Engineering Co.	6 oz.		To spec.	Used to adjust thermocouple lead resistance		
Firewall block	AN553701	Lewis Engineering Co.	3 oz.		To spec.	Used to carry thermocouple circuit thru firewall		
Temperature indicators	201	Thomas A. Edison	0.7 lb.	All standard ranges	Military specs.		28 V d-c	lg. single
Elec. ratio resistance	202	"	1.0 lb.	"	"		"	Dual
Elec. ratio resistance	203	"	1.3 lb.	"	"		"	Triple
Elec. ratio resistance	204	"	0.5 lb.	"	"		"	Single (sealed case)
Cylinder head temperature amplifier	184-04	Aviation Engrg. Corp.	1.56 lb.		3" x 4 $\frac{3}{8}$ " x 6 $\frac{1}{8}$ "		115 volts 400 cps	
Cylinder head temperature indicator	182-05	Aviation Engrg. Corp.	0.69 lb.		1.937" dia. x 4 11/64"		115 volts 400 cps	
Ammeter	RN-4000	Scott Aviation	5 oz.	- 30 amps + 30 amps	2 $\frac{1}{4}$ " x 1"	Dial		Single
Oil temperature gauge	RN-2100	Scott Aviation	9 oz.	100° to 250°	2 $\frac{1}{4}$ " x 1"	"		Single
Pressure pickup	Type 7	Transonics, Inc.	11 oz.	0-10 to 0-2,500	2 1/16" Dia. x 2 $\frac{1}{4}$ "	(Full Scale Output) 5 MV/V	To 15 volts d-c or a-c	Absolute or differential
Pressure pickup	Type 70	Transonics, Inc.	10 oz.	0-15 psia	2" D x 2 $\frac{1}{2}$ "	7500 ohms	To 75 volts d-c or a-c	Absolute or differential
Temperature pickup	Type 16, 17, 18, 19	Transonics, Inc.	Varies	- 300° to + 2,012° F.	For surface, gas & liquids	5 MV/V	0.02 amps. rms	Resistance thermometers
Temperature pickup	Type 21	Transonics, Inc.	8 oz.	- 300° to + 1,832° F.	2 11/16" x 1/4" x 1/16"	1 volt	0.02 amps. rms	Resistance thermometer

Established
1923

State Department
Expert
License 191



• Your dependable source for Pratt & Whitney parts; accessories and parts; Hamilton Standard assemblies and parts; PBY parts, etc.

• Our thirtieth year as suppliers to Airlines and Governments all over the free world.

P. O. Box 181
International Airport, Miami 48,
Florida
Phone 88-2464

Frank Ambrose Aviation Florida INCORPORATED

announces the formation of
Miami Machinery Distributors
Distributors of
The Revolutionary



**New Terra-
Lift Crawler
Fork-Lift!**

Manufactured by
American Tractor
Corporation
Churubusco, Ind.



Designed for special needs and purposes. Isn't this just what you wanted someone to produce for operation off runways and over rough terrain? Write for information.

MIAMI MACHINERY DISTRIBUTORS
5383 N. W. 36th Street
Miami Springs, Florida
Phone 88-2466



• RELAY

Manufacturer: Ward Leonard Electric Co.

Model: 103

Dimensions: 1 7/8" x 2 1/4" x 1 9/16"

General: One of a series of single pole, double throw aircraft power relays exceeding 10 g. acceleration tests. Designed primarily for d-c systems but also usable on a-c installations. Rated at 25 amps., at 24 volts d-c. (156*)



• VACUUM WARNING UNIT

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 3124

Weight: 1/2 lb.

Dimensions: 1 23/32" dia. x 2 1/4" overall (157*)



• POWER FAILURE INDICATOR

Manufacturer: Eclipse-Pioneer Div., Bendix Aviation Corp.

Model: 36200

Weight: 6 oz.

General: Used to monitor the 26-volt, 400-cycle-per-second, 3-phase power supply to show if any one of the three phases is interrupted. (158*)

Among the Catalogs

AIRCRAFT BATTERIES: Rebat aircraft batteries are dealt with in a two-color catalog prepared by Reading Batteries, Inc., which handles about 10 different models.

ELECTRICAL CONNECTORS: Titeflex, Inc. uses specification tables and schematic drawings to outline its electrical connector series, including Type 360 plug, and Types 324, 322, 320 receptacles, in a two-color, eight-page catalog.

TOWER LIGHTING: Hughey & Phillips catalog incorporates data on complete tower lighting kits of CAA specifications A-1 to A-5 towers and includes items essential for complete lighting installation.

CONTROL SYSTEMS: Bulletin 100-000, published by Ward Leonard Electric Company, takes up the characteristics and applications of the company's resistors, rheostats, relay and contactors, motor controls, dimmers and chrome plating units.

AIRCRAFT CONTROLS AND INSTRUMENTS: The Aerotec Corporation, manufacturers of pressure and float switches and valves, has utilized a loose-leaf folder to tell the story of specifications and applications of its products.

CONTROL SYSTEMS: A series of catalog sheets bound in a loose-leaf folder deal with Barber-Colman Company control systems, i.e., temperature sensing elements, control cabinets, actuators, rheostats, and micropositioners for aircraft use.

FUEL GAUGES: The Avien Fuel Gage System designed by the Aviation Engineering Corporation is described in a catalog which details applications and specifications for tank units, indicators, bridge units, amplifiers, and connectors.

COMMUNICATIONS ACCESSORIES: Complete line of headsets, brackets, transmitters, switches, panels, antenna reels, computers, and microphones of Telephonics Corporation are detailed in a loose-leaf catalog. Aviation products are incorporated.

INDUSTRIAL PLATING UNIT: Methods of utilizing Chromaster industrial hard chrome plating unit Model A-20 are given in bulletin IC 20 published by Ward Leonard Electric Company.

TEST CHAMBERS: Tenney Engineering, Inc., has issued a series of pamphlets to describe its altitude chambers for temperature, altitude, relative humidity, and flight simulation tests, temperature-humidity chambers with program control for meeting all government specifications, as well as servo units, industrial cabinets, and vacuum test chambers.

Only United's Main Line Airway

links the East and the Midwest

with all the Pacific Coast and Hawaii



Switches



● RAM AIR SWITCH

Manufacturer: The Aerotec Corp.

Model: P-904

Weight: 1.5 lbs.

Dimensions: 6 1/8" dia. x 4 1/2"

General: Utilized in conjunction with fuel solenoid valves on combustion heaters to stop fuel flow when the speed of air through the heater falls below safe operating minimums. Also used as stall warning device or to operate flaps, landing gears, and bomb bay systems at predetermined airspeeds. Operates from 28 volt d-c current. Operating range 1.5" H₂O at 2.5 psi. (159*)



● SNAP ACTION SWITCH

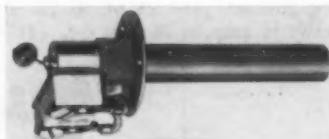
Manufacturer: Unimax Switch, Div. of the W. L. Maxson Corp.

Model: X-101

Weight: 0.5 lbs.

Dimensions: 3.5" x 1" x 3.2"

General: One of a series of Unimax immersion proof snap action switches for a-c and d-c systems. D-c 28 volt ratings range from 5-25 amperes and a-c 50/60 cycle ratings range from 125-600 volts with a corresponding range from 15 down to 2 amps. (160*)



● THERMAL SWITCH

Manufacturer: Fenwal Inc.

Model: 17320-4

Weight: 0.339 lbs.

Dimensions: 5.5" x 2"

General: A single-pole, single-throw adjustable switch which breaks contact with increasing temperatures. Operating range -100° to +300° F. Used to interrupt circuits such as aircraft combustion heater circuits, when the temperature reaches the desired setting. (161*)



● PRESSURE SWITCH

Manufacturer: General Controls Co.

Model: AL-58E

Weight: .88 lbs.

Dimensions: 3.75" x 3.50" x 2.68"

General: A pressure switch of the bourdon tube type available in normally-open and normally-closed arrangements, with ranges from 15-60 psi up through 400-7,500 psi. Suitable for air, petroleum derivatives, alcohol, and other fluids not corrosive to phosphor-bronze, including Skydrol & Hydro-lube H-2. (162*)



Looking
For
More
Information?

See pages 5 & 6.



● PRESSURE ACTUATED SWITCH

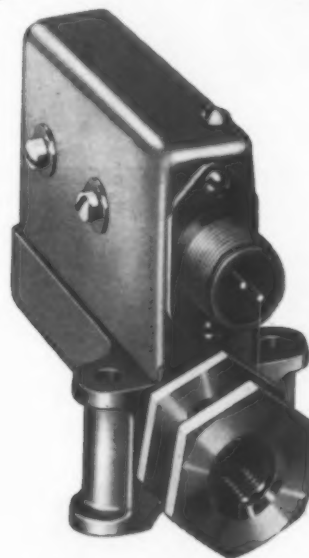
Manufacturer: Meletron Corp.

Model: 417

Weight: 14 oz.

Dimensions: 3" dia. x 4 1/8"

General: A single-pole, double-throw, differential pressure switch, the model 417 switch is used in 28 volt d-c systems and has a range from 0 to 200 psi. (163*)



● FLUID PRESSURE SWITCH

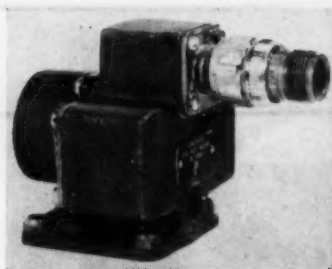
Manufacturer: General Controls Co.

Model: AL-58D

Weight: 0.5 lbs.

Dimensions: 4.42" high

General: A piston type pressure switch with a regulating range up to 10,000 psi, the model AL-58D is used as a pressure limit control for operation of pumps, warning lights, and other devices in aircraft fluid systems. Used with fluids having at least some lubricating qualities. (164*)



● PRESSURE SWITCH

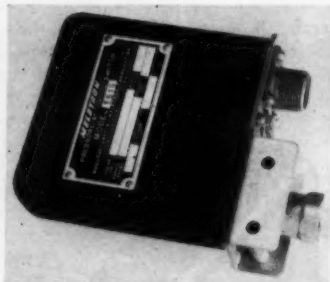
Manufacturer: Lear, Inc., Romec Division

Model: RB-8361

Weight: 0.56 lb.

Dimensions: 3½" x 2½"

General: An absolute pressure switch for operation with 28 volt d-c or 118 volt a-c current, the model RB-8361 switch is used for radar pressurizing. Range of operation is from 28" to 32" Hg. (165*)



● PRESSURE ACTUATED SWITCH

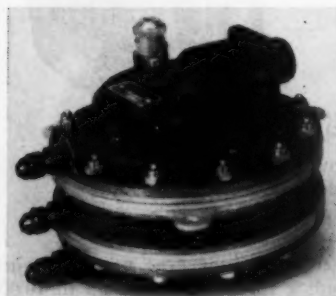
Manufacturer: Meletron Corp.

Model: 1516

Weight: 15 oz.

Dimensions: 5½" x 3½" x 1½"

General: A single-pole, double-throw, high pressure switch, the model 1516 is used in 28 volt d-c systems and has a range from 50 to 6,000 psi. (166*)



● AFTERBURNER PRESSURE SWITCH

Manufacturer: The Aerotec Corporation

Model: P-1200

Weight: 2.25 lbs.

Dimensions: 5" dia. x 3½"

General: A dual diaphragm pressure switch, the model P1200 is used as a jet engine afterburner eyelid control. Suitable for temperatures from -65° to +350° F. This unit is designed for a maximum pressure of 30 psi and draws ¼ amp. at 28 volts d-c. (167*)



● TRIM TAB SWITCH

Manufacturer: General Control Company

Model: BS-58-000

Weight: 1 lb., 14 oz.

Dimensions: 6½" x 3½" x 3-7/16"

General: A circuit selector type switch, the BS-58-000 is rated for 24 volt d-c system operation. Selections include nose—left or right, nose—up or down, and left wing down, right wing down. (168*)



● SNAP ACTION SWITCH

Manufacturer: Unimax Switch, Div. of The W. L. Maxson Corp.

Model: KMXN

Weight: 0.3 lbs.

Dimensions: 3" x 1" x 2-55/64"

General: One of a series of Unimax KMXN plunger type switches for a-c and d-c operation over a range of from 6 to 230 volts d-c and 110 to 250 volts a-c. Operating force requirements are from 10 to 20 oz. (169*)



● DUAL FLOAT SWITCH

Manufacturer: The Aerotec Corp.

Model: F6001

Weight: 1.3 lbs.

Dimensions: 3½" dia. x 8½"

General: A dual float unit, the F6001 series is used in wing tip tanks completely immersed in fuel to provide primary and emergency actuation of shut-off valves on increasing fuel levels. Operates on 28 volts d-c. (170*)



● SNAP SWITCH

Manufacturer: Micro Switch Corp.

Model: A419

Ratings: ¾ hp, 115 volts a-c; 1½ hp, 230 volts a-c

General: Typical of a series of Micro Switch designs, the model A419 is rated as follows: 20 amps.—125, 250 or 460 volts a-c; 10 amps.—125 volts a-c; ½ amp.—125 volts d-c; ¼ amp.—250 volts d-c. (171*)



● ROTARY POWER TAP SWITCHES

Manufacturer: Ohmite Mfg. Co.

Model: 608

General: One of a series of non-shorting rotary tap switches with ratings from 10 to 100 amperes measuring from 1¼" to 6" in diameter. (172*)



Two Special Purpose Connectors by



Battery Connectors

8-pin type for both A and B batteries used in all types of field communication equipment. "RUGGEDIZED" for extra security and long service life: polarizing stud is ALL METAL and all metal parts are cadmium plated and sealed with an iridite sealer. Cable may be brought out at any desired side position and locked. Handy bail makes removal from inaccessible places easy.

Quick Disconnect

Simply push male and female members together and lock. To disconnect with minimum resistance, pull back sleeve on plug shell and disconnect. Exceptionally low disengaging force required (less than 6 lbs., excepting pin friction). Vibration proof, moisture-proofed with synthetic rubber insert. Meets AN pin pattern and voltage requirements, in accordance with MIL C-5015. Plug shell and coupling sleeve are aluminum alloy, cadmium plated and iridite-sealed. (Federal Spec. QQP - 416, Type 2.)



Receptacle Types:

Round flange single hole panel-mounted, square flange for 4 bolts, or specially flanged to specification. All contacts silver plated.

We invite your inquiries on any problems concerning connectors. Our wealth of engineering experience in this specialty is at your service.

BREEZE
CORPORATIONS, INC.

41 South Sixth Street, Newark, N. J.

General Switches

Unit Name	Mfr.	Model	General Type	Wt.	Rating	Dimensions Length-Width-Height	Range	Remarks
Switch hyd. actu- ated elec.	Bobrick Mfg. Corp.	601	Single pole, in open position	9 lb.	28 V 10 amp.	Max. 5 $\frac{1}{4}$ " x 3 $\frac{1}{2}$ " x 1 $\frac{1}{8}$ "	125 psi- to 160 psi	Choice of: switches, electrical connections
"	"	602	"	"	"	"	150- 450 psi	"
"	"	603	"	"	"	"	400- 850 psi	"
Thermo- switch heater control	Fenwal Inc.	18628-2	SPST Herm. sealed adjustable	.172 lb.	2 amps 28 v d-c	5" x 1 $\frac{37}{64}$ "	-100° F.- 550° F.	Rate of rise
"	"	17321-2	SPST adjustable	.339 lb.	2 amps 28 v d-c	5 $\frac{1}{4}$ " x 2"	100° F.- 350° F.	Makes on increase
"	"	17322-3	"	"	"	5" x 1 $\frac{3}{4}$ "	250° F.- 450° F.	Breaks on increase
Snap action switch	Unimax, Div. of W. L. Maxson Corp.	LK	SPDT immersion proof	0.35 lb.	10 amps at 28 v d-c resistive load	2 $\frac{1}{8}$ " x $\frac{3}{8}$ " x 3 $\frac{1}{2}$ "		Operating force 10 lbs.
Rotary selector switch	Meletron Corp.	1000	Up to 6 wafer 6 pole, 8 position	14 oz.	28 d-c	2 $\frac{5}{8}$ " Dia.		Available with up to 6 wafers
Differ. Fuel Pres. Switch	MHR Co.	G20	SPST	14 oz.	24 volt	2 $\frac{1}{8}$ " Dia. x 4 $\frac{3}{4}$ "	0-20 psi operating	Double seal protection
Air Pres. Switch	MHR Co.	PG208	SPDT	17 oz.	12 or 24 volt	4 $\frac{3}{4}$ " Dia. x 2 $\frac{1}{4}$ "	1-11 in. H2O	
Pressure Switch	Stewart Warner		Rising or falling pressures	4 oz.	6 & 12 volt	2 $\frac{1}{2}$ " x $\frac{7}{8}$ "	0 to 200 lbs.	
Pressure Switch	Cornelius Co.	173DO 100	Piston 1P-1T	1.0 lb.	28.5 volts 10 amps d-c	4 $\frac{1}{8}$ " x 3 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ "	400 to 3500 psi	
Pressure Switch	Gen. Con- trols Co.	AL-58G	Differential & Gauge	.48 lb.		3.62" in Diameter		Variations from 0 thru 45 psi
Pressure Switch	Gen. Con- trols Co.	AL-58K	Differential & Gauge	.60 lb.		3.07" in Height		Variations from $\frac{3}{4}$ thru 55 psi

Snap Action Switches

Unit Name	Mfr.	Model	Dimensions	Weight	Remarks	Type
Snap action switches	MICRO Division of Minn.-Honey.	BZ-R31	1 $\frac{15}{16}$ " x $\frac{11}{16}$ " x $\frac{61}{64}$ "	.059 lb.	"Pin" plunger basic switch, AN3210-1.	S-P, D-T
"	"	BZ-7RST	1 $\frac{15}{16}$ " x $\frac{11}{16}$ " x 1 $\frac{15}{32}$ "	.063 lb.	Spring-loaded type "S" plunger, AN3215-1.	S-P, D-T
"	"	BZ-7RDT	1 $\frac{15}{16}$ " x $\frac{11}{16}$ " x 1 $\frac{3}{16}$ "	.064 lb.	Spring-loaded, hardened steel plunger.	S-P, D-T
"	"	BZ-7RQ1T	1 $\frac{15}{16}$ " x $\frac{11}{16}$ " x 1 $\frac{55}{64}$ "	.093 lb.	Panel mounting, manual or mechanical push button switch.	S-P, D-T

Other Switches

Unit Name	Model	Mfr.	Weight	Range	Dimensions	Power Req.	Single or Dual Type
Window temperature control	C-1E	United Control Corp.	2.70 lbs.	90° to 130° F.	4.5" x 4.9" x 6.9" (approx.)	115V+5V 380-1000- 25V-A	Single
Electronic switch	A1-4-1	"	0.5 lb.		4.6" x 2.2" dia.	115+5V	Single
Rotary cam switch	CS1180-1 CS1180-2A	"	2 lbs. 7 lbs.	360° 360°	4.12" x 4" x 4.63" 9" x 6" x 5.2"	Rating: 3A induc. at 28V	Multiple
Thermal switch	G1-1	"	.055 lb.	100°	0.6" x 1.20" dia.	2A Res. at 115 VAC	Single



SAFETY EQUIPMENT



● DISTRESS SIGNAL

Manufacturer: Aerial Products, Inc.

Model: HP

Weight: 5 oz.

Dimensions: 5 1/16" x 1 5/8" dia.

General: A hermetically-sealed orange smoke and red flare for hand use in emergencies. (173*)



● FLASHLIGHT

Manufacturer: Bright Star Battery Co.

Model: 1624

Weight: .5 lbs. approx.

Dimensions: 9 1/4" x 2 1/2"

General: A three-cell focusing industrial safety spotlight with removable switch. (174*)



● LIFE RAFT

Manufacturer: Goodyear Aircraft Corp.

Model: ATA

General: 10-, 15-, and 20-passenger capacity designed to ATA specifications. (175*)



● LIFE RAFT

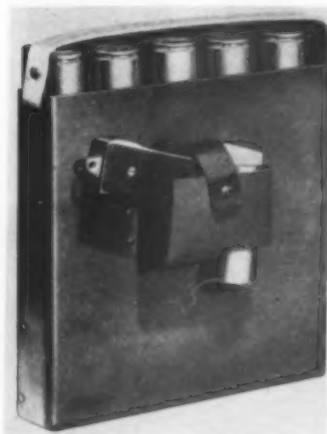
Manufacturer: Air Cruisers Company

Model: 2920

Weight: 107 lbs.

Dimensions: 12' 1" dia.; 20' x 18 1/2' x 35 1/2' package

General: A 20-man life raft with canopy conforming to CAA TSO C-12 and NAS 800. (176*)



● FLARE KIT

Manufacturer: Kilgore, Inc.

Model: K-37-F5

Weight: 11 lbs.

General: CAA-approved for use in aircraft up to 3,500 lbs. gross weight. (177*)



● AIRCRAFT FLARE

Manufacturer: Kilgore, Inc.

Model: SA-8

Weight: 18 lbs.

Dimensions: 25 1/2" long x 4 1/2" dia.

General: Three-minute flare for night emergency use. (178*)



● FIRST AID KIT

Manufacturer: Medical Supply Co.

Model: CAA No. 2 16-unit kit

Weight: 4.5 lbs.

Dimensions: 6 5/8" x 9 1/8" x 2 3/4"

General: Meets CAA requirement for aircraft with five to 25 passengers. Dust and moisture proof. Conforms to Federal specification GKK-391. (179*)



● LIFE JACKET

Manufacturer: Air Cruisers Company

Model: AD-4

Weight: 1.6 lbs.

General: A 1-man life jacket built to conform to CAA spec TSO C-13. (180*)



Looking
For
More
Information?

See pages 5 & 6.

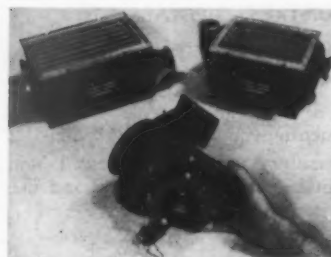
Air Conditioning & Pressurization



● AIRCRAFT HEATERS

Manufacturer: Surface Combustion Corp.
Model: Janitrol combustion heaters (see photo)

General: Accompanying photo and chart show eight models of airborne and portable ground heaters ranging from 15,000 BTU output to 600,000 BTU output. Coded to the chart and reading from left to right clockwise are models S-600, S-300, S-125, S-100, S-200, S-50, V-15, and S-25. (181*)



● REFRIGERATION UNIT

Manufacturer: Stratos Div., Fairchild Engine & Airplane Corp.

Model: NUR15

Weight: 17 lbs.

Output: 18.5 lbs./minute at 28° F.

General: A combination of five air-to-air heat exchangers and an expansion turbine designed for use on military jet fighter aircraft such as F-86-F. The newest of Stratos' refrigeration units, the NUR15 uses ram air from the jet engine inlet to precool hot air taken from later stages of engine's compressor. Ambient air is drawn through second heat exchanger by a blower which is part of the refrigeration unit. (182*)

* For more information see pages 5 and 6.



● TEMPERATURE CONTROLS

Manufacturer: Barber Coleman Co.

Model: Martin 404 system units shown.

General: Includes rotary and linear actuators, temperature selector, control box, and temperature sensing elements. Controls duct, surface and cabin-cockpit temperatures. (183*)

HERE'S GOOD NEWS!

NEW TVOR

AT LESS THAN

one fourth the cost of **VOR!**

- increases plane let-down safety for any airfield
- changes "fair-weather" to all weather airline service
- permits marginal weather landings by private and executive aircraft.



This new terminal VHF omnidirectional radio range adds safe instrument approach facilities to any airport. CAA approved. Installs directly on the airfield. Includes field detector, antenna and installation test equipment. *And is available on 90 day delivery.*

Made by a company specializing in VOR systems for the CAA and foreign governments, TVOR radiates 50 watts of power, ample for most installations. Time tested circuits, using the same quality components and given the same rugged tests as CAA equipment, are easy to maintain and service. Installation operates almost entirely without attention. Any plane with standard VOR instrumentation can make precision approaches to a TVOR equipped field.

TVOR can build your field's air traffic by extending service through marginal weather . . . increase airline passenger service by eliminating flights lost due to rain and fog . . . brings corporation aircraft to their home field in spite of low ceilings.

Flight test TVOR with your own plane at the College Park Airfield. Visit our factory at the edge of the field. Inspect the equipment. Convince yourself that your group can not afford to be without low cost, high quality TVOR.

TVOR single unit installation needs only an inexpensive shelter on the field.



TVOR changes fair-weather to all weather airline service.



TVOR guides corporation aircraft to their home fields, in spite of low ceilings.



TVOR works with standard instrumentation. Private planes "home" on their own airfield.



TVOR commercial transmitters are the same as those designed and built for the CAA.

MARYLAND ELECTRONIC MANUFACTURING CORPORATION
COLLEGE PARK 16, MARYLAND

Air Conditioning & Pressurization

Unit Name	Mfr.	Model	Weight	Power Req.	Output	Dimensions	Usage	Type Drive
Air compressor	Lear, Inc., Romec Div.	RG-8160	3.5 lbs.	1/15 hp	80 cu. in./min. @ 35,000 ft.	6-1/2" x 4-5/16"	C-97, T-29, C-119, C-121 C-118, C-124	27 v motor
"	"	RG-8160-1	5.1 lbs.	1/5 hp	80 cu. in./min. @ 50,000 ft.	5-5/8" x 5-9/16"	B-36, B-47	115 v 400 cps motor
"	"	RG-9065	9.3 lbs.	1/4 hp	565 cu. in./min. 9 in. Hg absolute inlet 34 in. Hg absolute outlet	8-5/16" x 4-1/8"	F86D F94C	27 v motor
Pressurizing kit	"	RR-9470	9.5 lbs.	1/15 hp	80 cu. in./min. @ 35,000 ft.	10-1/8" x 6-5/8" x 10"	Boeing B-50	27 v motor
"	"	RR-9650	13.9 lbs.	1/15 hp	300 cu. in./min. @ 50,000 ft.	11-3/4" x 9-5/8" x 7-7/32"	McDonnell F3H	27 v motor
"	"	RR-9500B	13 lbs.	1/5 hp	80 cu. in./min. @ 50,000 ft.	10-11/16" x 8-7/16" x 8-1/8"	Ground radar	115 v
"	"	RG-8940	9 lbs.	1/5 hp	80 cu. in./min. @ 50,000 ft.	10-7/8" x 6-5/16" x 6-7/8"	Ground radar test	115 v 400 cps motor
"	"	RG-8990	7.5 lbs.	1/15 hp	80 cu. in./min. @ 35,000 ft.	10-7/8" x 6-1/2" x 6-1/8"	"	27 v motor
Air pump and control unit	Eclipse Pioneer	33E00	9.5 lbs.	28 v 10 amps	1.5 cfm @ 10,000 ft. 40" Hg absolute discharge pressure			
Radar pressurizing control panel	Lear, Inc. Romec Div.	RR-9880A	2.47 lbs.			5-3/4" x 4-11/16" x 3-3/4"	B-52	115 v a-c circuit
"	"	RG9380A	2.3 lbs.			5-3/4" x 4-11/16" x 3-3/4"	Used with RG8160 air compressor	27 v circuit
Desiccator	"	RR-9530	7.4 lbs.	1/50 hp	40 cu. in./min.	10" x 6-3/4" x 3-1/2"	With bombsight B-47	27 v motor
"	"	RR-9355	9.5 lbs.	1/5 hp	800 cu. in./min.	10" x 8" x 5-1/2"	With bombsight B-52	115 v 400 cps motor
"	"	RG-8995	9.0 lbs.	1/5 hp	80 cu. in./min. @ 50,000 ft.	10-3/16" x 7-1/4" x 7-1/32"	For bombsight	"
Dehydrator	"	RD-8180	1.5 lbs.	none	30 cu. in./min. Silica gel	3-1/4" x 3-1/4" x 6-15/16"	C-97, T-29, C-119, C-121, C-118, C-124	none
"	"	RD-9450	0.72 lbs.	none	8 cu. in./min. Silica gel	3-1/8" dia. x 3-21/64"	Airborne radar equipment	"
"	"	RD-8080	3.25 lbs.	none	60 cu. in./min. Silica gel	6-1/2" x 3-1/4" x 6-15/16"	F94C	"



● DRY AIR PUMP

Manufacturer: Eclipse-Pioneer Div.,
Bendix Aviation Corp.

Model: 1511

Weight: 5.25 lbs.

Output: 15 lbs./min. or 2 cu.ft./min. at
sea level, 26" Hg. absolute inlet pres-

sure, 30" Hg. absolute outlet pressure.

General: Operating on 27.5 volts and
drawing 6.5 amps, the model 1511 dry
air pump provides air or vacuum for
cameras, noxious gas detection, igni-
tion, radio harness, and fuel tank
pressurization. (184*)

● CABIN SUPERCHARGER

Manufacturer: Stratos Div., Fairchild
Engine & Airplane Corp.

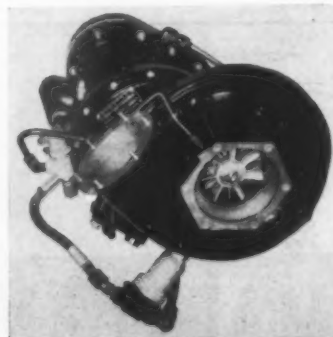
Model: S-60-5

Weight: 58 lbs.

Output: 65 lbs./min.

Power requirements: 30-70 hp

* For more information see pages 5 and 6.

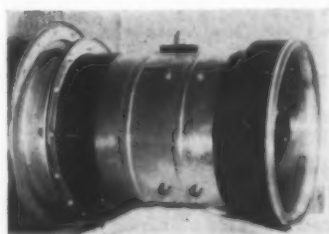


General: Driven off engine accessory
section, the S-60-5 is one of six models
ranging in air output from 45 to 78
lbs./min. as shown in chart. (185*)

Engineering Data

Unit Name	Manufacturer	Model	Weight	Power Req.	Output	Example of Exist. Inst.	Type Drive
Air cycle refrigeration (jet bleed type)	Stratos Div., Fairchild Engine & Airplane Corp.	NUR12	14 lbs.		Air 10-14 lbs.	F2H	Bleed air from jet engine
"	"	NUR15	15 lbs.		Air 14-18 lbs./min.	A2D	"
"	"	NURH15	17 lbs.		Air 18 lbs.	F-86F	"
"	"	NUR20	27 lbs.		Air 16-26 lbs./min.	XF93	"
"	"	NUR30	21 lbs.		Air 24-40 lbs./min.	A2J-1	"
"	"	NUR60	45 lbs.		Air 40-100 lbs./min.	B-47	"
Cabin supercharger	"	S-20	20 lbs.	15 hp	Air 20-30 lbs./min.	AJ-1 & AJ-2	Hydraulic variable drive
"	"	S-50-3	60 lbs.	30-70 hp*	Air 55 lbs./min.	Beech T-36	Engine accessory drive
"	"	S-60-1	58 lbs.	30-70 hp*	Air 65 lbs./min.	Air France Constellation L-749	"
"	"	S-60-5A	58 lbs.	30-70 hp*	Air 43-65 lbs./min.	PAA, BOAC Constellation L-049	"
"	"	S-60-6	56 lbs.	30-75 hp*	Air 78 lbs./min.	Canadair RCAF C-5	"
"	"	S-60-10	58 lbs.	30-70 hp*	Air 65 lbs./min.	AVIANCA, Air France Constellation 749	"
"	"	S-60-11	65 lbs.	30-70 hp*	Air 62 lbs./min.	PAA Convair	"
Air cycle refrigeration (cabin cooling)	"	BUR20-1B	37 lbs.		Air 20 lbs./min.	AJ-1	Supercharger air
"	"	B-60-3 B-60-2	24 lbs.		62 lbs./min @ 35°F	PAA Constellation L-049	"

* Units use less than 5 hp when not supplying cabin air.



● AIRCRAFT BLOWER

Manufacturer: Dynamic Air Engineering, Inc.

Model: M-8862B-8B

Weight: 35 lbs.

Diameter: 9"

General: A two-stage blower for main

cabin air recirculation (two are used in Lockheed Constellation) providing 1,300 cu.ft./min. at 8" Hg. static pressure. * (186*)

● AIRCRAFT BLOWER

Manufacturer: Dynamic Air Engineering, Inc.

Model: M-4582 AD-2A

Weight: 9 lbs.

Diameter: 4.75"

General: A two-stage ventilation blower supplying 225 cu. ft./min. air at 6" Hg. static pressure for airplane heating systems and general ventilation.

(187*)



● REFRIGERATION UNIT

Manufacturer: Stratos Div., Fairchild Engine & Airplane Corp.

Model: BUR50

Weight: 80 lbs.

Output: 55 lbs./min. at 45° F.

General: An air cycle refrigeration unit for cabin cooling such as used on the Beech T-60.

(188*)

Aircraft Heaters

Unit	Mfr.	Model	Weight	Power Req.	Output	Dimensions
Aircraft heater	Janitrol	V-15*	6 lbs.	10 amps with glow core	15,000 BTU	4 $\frac{3}{4}$ " dia. x 16 $\frac{3}{4}$ " long
"	"	S-25† V-25	12 lbs.	24 v as V-15	25,000 BTU	6" dia. x 16 $\frac{1}{2}$ " long
"	"	S-50	18.5 lbs.	12 v or 24 v d-c	50,000 BTU	7" dia. x 20" long 7" dia. x 17 $\frac{3}{4}$ " long
"	"	S-100	20.5 lbs.	"	100,000 BTU	7 $\frac{1}{2}$ " dia. x 33" long 8 $\frac{1}{2}$ " dia. x 32" long
"	"	S-125	21 lbs.	"	125,000 BTU	8 $\frac{1}{2}$ " dia. x 32" long
"	"	S-200	28 lbs.	"	200,000 BTU	10" dia. x 22 $\frac{3}{4}$ " long
"	"	S-300	75 lbs.	24 v d-c	300,000 BTU	11 $\frac{1}{2}$ " dia. x 38" long
"	"	S-600	100 lbs.	"	600,000 BTU	15" dia. x 36" long
Portable ground heater	"	G-400	235 lbs.	24-28 v d-c	400,000 BTU	25" h. x 50" x 20" w.
Aircraft heater	Stewart Warner	28 models	16-87 lbs.	6, 12 or 24 v	20,000 to 700,000 BTU	7" dia. x 20" long to 15" dia. x 38" long

* Vapor type

† Spark-spray type



Millions of Lock-O-Seals help keep America's aircraft the safest in the world—sealing rivets, bolts, studs, bulkhead, electric terminals, and in hundreds of components... Lock-O-Seals are one of the many sealing devices designed and sold by Franklin C. Wolfe Company. If you have a sealing design problem our specialized experience can be of assistance. May we send you information about our free design consultation service? Representatives in all major aircraft centers. Write or wire Dept. A-10.

FRANKLIN C. WOLFE CO.
3644 Eastham Dr. Culver City, Calif.

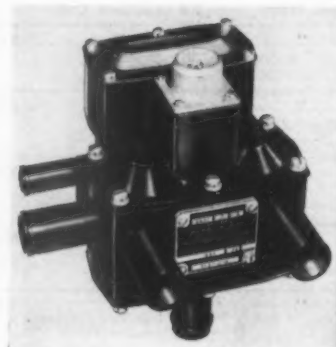
Makers of LOCK-O-SEAL • GASK-O-SEAL • TERMIN-O-SEAL • "O" RINGS

Note: Lock-O-Seals are approved by USAF for use on military aircraft.

"Sealing design specialists"

* For more information see pages 5 and 6.

Deicers



● AIR DISTRIBUTOR VALVE

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 1532

Weight: 2 lbs., 3 oz.

General: A solenoid-operated distributor valve for manifold deicer air system. Operates from 24-volt power supply. (189*)

● DEICER TIMER

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 42E00

Weight: 6.25 lbs.

General: An electronic timer used with pneumatic deicing systems for airfoil ice protection. Unit provides for automatic cycling in a predetermined sequence to provide optimum deicing. Unit permits pilot to select type of operation required for specific icing conditions. Operates on 24 volts d-c current. (190*)

● REGULATOR & OIL SEPARATOR

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 1545

Weight: 7 lbs.

General: A combination regulator, unloading valve and oil separator, setting range 10"-20" Hg. relief valve set at 16" Hg. 24 volts d-c required for solenoid operation. Removes entrained oil from air supply to deicer boots, controls system air pressure, and discharges air from pumps when deicer system is not in use. (191*)

Engine-Parts Production

Reciprocating engine and spare parts production status is reflected in this table, a recapitulation of information obtained in a survey of engine manufacturers conducted by AMERICAN AVIATION.


Engine Manufacturer & Model	Production		Parts		Lead Time Required	
	Engines	Parts Only	Production	On Call	Engines	Parts
Pratt & Whitney Aircraft Div. of United Aircraft Corp.						
R-985 Wasp Junior ....	..	X	X	..	..	Varies
R-1340 Wasp .....	..	X	X	..	..	"
R-2000 Twin Wasp	X	..	X	..	Varies	"
R-2800 Double Wasp ..	X	..	X	..	"	"
R-4360 Wasp Major ...	X	..	X	..	"	"
Note: Parts manufactured to order on other non-current models.						
Wright Aeronautical, Div. Curtiss-Wright Corp.						
Cyclone 7 R-1300 -1, -2 and -3	X	..	X	..	NA	NA
Cyclone 9 R-1820-76B, -80, -82, and -103	X	..	X	..	NA	NA
Cyclone 18 C18DA1, DA2, R-3350-32W, -34 and -85	X	..	X	..	NA	NA
Note: Parts manufactured for many older commercial engines back to R1820-G100.						
Lycoming-Spencer, Div. Avco. Mfg. Co.						
O-235-C1, O-290-D, -D2, O-435-A, -C2	X	..	X	..	5-8 mos.	2-8 mos.
GSO-580-C, -D	X	..	..	X	9 mos.	4-9 mos.
Jacobs Aircraft Engine Company						
R-775-A, -B	X	..	X	..	1-4 wks.	2-3 wks.
L-4MB, -6MB .....	..	X	..	X	..	Stock to 4 wks.
Continental Motors Corp.						
18, 65, 75, 85, 90, 125, 145, 185, 205, 225, 550 and 670	X	..	X	..	1-8 mos.	stock
Note: Model A-40 not in production, engines or parts. NA—Not Available.						

METAL HOSE: Uniflex, seamless flexible metal hose designed by Titeflex, Inc., is described in an eight-page brochure with drawings, spec tables, and illustrations of typical assemblies.

FLEXIBLE HOSE: Catalog No. 113-A takes up design and construction characteristics of Titeflex all-metal tubing along with specifications for the various types manufactured.

FASTENERS: A series of catalog sheets and folders deal with the products of Townsend Company, manufacturers of the Tufflok nut, metal fasteners, lock-nuts, and cherry rivets.

HOME OF THE FAMOUS
Hawaiian Room
THE PERENNIALY POPULAR
NEW YORK ADDRESS



Hotel Lexington
 CHARLES E. ROCHESTER, President
 George W. Miller, Manager
 LEXINGTON AVE. AT 48TH ST., N.Y.C. 17

Catalogs

ENGINE COOLERS: "Oil Coolers for Aircraft Engines" is a four-page folder put out by The G & O Manufacturing Company to describe five models of oil coolers.

FIRE EXTINGUISHING SYSTEMS: How Cardox Corporation uses carbon dioxide for fire protection is detailed in an 8-page brochure with descriptions given of cylinder filling unit, smoke detector, fire trucks, and other equipment.

AIRCRAFT HYDRAULIC JACKS: Sancier aircraft hydraulic jacks are described in a loose-leaf binder with specifications, tables and photographs of the products.

In Stock
AN HARDWARE

Nuts Rivets Fittings Spacers Pulleys
 Belts Screws Hinges Washers Pins

AMC SUPPLY
 Division of Air Accessories, Inc.
 P. O. BOX 1440 PHONE EDISON 9377 FORT WORTH, TEXAS

Scheduled Coaches Termed Adequate

Scheduled airlines will have "more than adequate facilities" to meet demands of the public for low-cost air travel long before CAB completes its investigation of the large irregular air carrier industry. This was the testimony of top airline officials at CAB hearings last week as they fought claims made earlier that there is a "need" for certification of non-scheduled airlines.

The CAB hearings are to determine if there is a need for "additional and supplemental" services of non-scheduled lines and which carriers, if any, should fill such need.

Scheduled carriers made these points before the Board:

- **Expansion of scheduled coach services**, most of it contemplated for next spring, will meet the demand.
- **Competition among scheduled lines** is so great as to render any additional competition uneconomical.
- **Non-scheduled lines** are "one-family affairs" with little investment, out to make a "fast dollar," and with little assurance they will continue in

business if the current traffic boom should be deflated.

American Airlines' general sales manager, Charles R. Speers, said his company plans to increase capacity of its DC-6 coach planes from 70 to 80 seats and to double its transcontinental coach service by next spring. AA now operates four daily DC-6 coach flights between New York and Los Angeles, providing 280 seats in each direction. Speers said new plans call for seven daily DC-6 coach flights under the higher seating arrangements, or 560 seats in each direction.

TWA's vice president E. A. Cocke said TWA's transcontinental service will be increased to nine daily flights by the spring of 1953, eight of which will be with 81-passenger Constellations and one with 70-passenger DC-4's. This would mean 718 seats daily over TWA, in addition to various shorter-haul services. In all, TWA will have 24 four-engine aircraft devoted to coach services, 19 of which will be high-density Constellations; the remainder, DC-4's.

sequently, the case will move to Los Angeles and Seattle, with the possibility of a final general session in Washington, D. C. being considered by CAB examiners.

There are no indications of an immediate CAB ruling in the **C-46 Weight Reduction Case** although the matter was submitted for Board decision last March. Proceeding centers around CAA claims that the current emergency 45,000 pound maximum weight limitation for C-46's in passenger service is too high. In January 1952, CAB cut the figure from 48,000 pounds to increase safety characteristics of the plane, used predominantly by large irregular carriers.

One of the most controversial and important proceedings, from the local service airlines' standpoint, the **Pioneer Air Lines Mail Rate Case**, moved one step nearer completion recently when briefs were filed with CAB. Big question is whether CAB will underwrite with mail pay the operations of local service lines with modern postwar equipment. Pioneer was first to take the step with a switch from DC-3's to Martin 2-0-2's. Next step before CAB is oral argument with a decision likely in December.

Southern Service to West Case Limited

The Civil Aeronautics Board refused last week to expand the Reopened Southern Service to the West Case other than to include a new investigation into a possible Miami-Houston interchange via National and Eastern. Faced with petitions to include various new route applications in the case once noted for its one-carrier southern transcontinental route implications, CAB denied expansion to avoid an "even bigger proceeding than the original."

Parties were given 10 days to take exception to the Board's ruling. Barring any change resulting from such exceptions, the controversial case will go to hearing on December 10, on these issues:

- **A possible Florida-California interchange service** via Eastern, Braniff and TWA;
- **A limited trans-Gulf route** for Eastern to be used only in conjunction with through interchange services; and
- **The new investigation** involving an Eastern-National interchange between Miami and Houston.

The first two of these issues were approved by CAB earlier this year but subsequent court action by National prevented their ever becoming effective. The third issue was requested by National after CAB decided to reopen the case for further hearings.

AS OF NOW . . .

Six applicants loom as potential operators of certificated all-cargo services across the Atlantic, and their bids will be aired at public hearings beginning December 10. Known as the **Trans-Atlantic Cargo Case**, the proceeding grew from the original applications of Seaboard & Western and Transocean to include, by CAB consolidation order, those of European-American, Flying Tiger, Trans Caribbean Air Cargo, and Overseas National. CAB denials of original applications of Seaboard, Transocean, and European-American were set aside by direction of President Truman to permit final decision on a more up-to-date record.

Hearings are slated to begin December 3, in the **United Air Lines Restriction Case** in which UAL seeks removal of a restriction in its transcontinental certificate which prevents non-stop operations between points east and west of Salt Lake City.

The schedule for hearings in the **Large Irregular Air Carrier Investigation** has hit a snag because of the unexpected length of the Washington, D. C. session. To avoid the winter tourist season in Miami, the Washington hearings, which started September 3, will be suspended November 5, with the Miami session starting November 10. When that concludes, the Washington session will resume, probably around January 12. Sub-

RECENT CAB DECISIONS

• **Compania Cubana de Aviacion, S. A.** authorized to serve Varadero, Cuba, as an intermediate on its Miami-Havana route.

• **American Society of Travel Agents** denied reconsideration of order approving 6% commission for trans-Atlantic air tourist sales.

• **Pan American World Airways** approved service plan amended to permit (1) service to Glasgow, Scotland, on New York-Frankfort sector and (2) service between Hanover and Berlin, Germany, subject to conditions.

• **Investigation** into need for additional joint use of facilities by domestic trunk airlines, instituted in February 1949, closed in view of separate action taken by the Board.

CAB CALENDAR

Oct. 28—Oral argument before the Board in Additional North-South Service to Tulsa Case and Mid-Continent Route No. 80 Renewal Case. Washington. (Dockets 2936 & 3693).

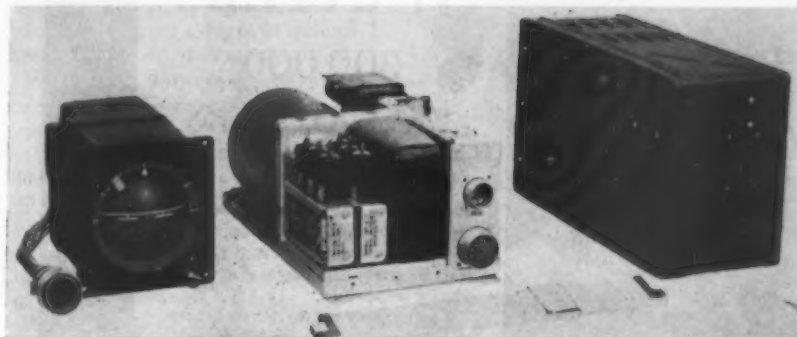
Nov. 12—Hearing in Pioneer Air Lines Lubbock-Albuquerque Certificate Renewal Case. Tentative. (Docket 5500).

Dec. 3—(Docket 2190). Hearing in United Air Lines' Restriction Case. Seattle, Washington. (Docket 2190).

Dec. 10—Hearing in Reopened Southern Service to the West Case. Tentative. (Docket 1102 et al.).



INSTRUMENTS



LEAR'S VERTICAL GYRO indicator system, shown above, is now in use in USAF bombers and in jet fighters. System includes indicator, amplifier and gyro control assembly. (192*)



● GYRO HORIZON INDICATOR

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 14603

Weight: 3¼ lbs.

Dimensions: 3¼" dia. x 7¼" long

General: An electrically driven non-tumbling gyro vertical indicator using 115-volt, 400-cycle, 3-phase a-c. Includes power failure flag alarm.

(196*)



● TURN & BANK INDICATOR

Manufacturer: Eclipse-Pioneer Div., Bendix Aviation Corp.

Model: 3906 (See chart for other models)

Weight: 1.6 lbs.

Dimensions: For standard panel cutout.

General: A direct reading, panel mounted turn & bank indicator with 5/16" — 5/32" deflection per 180°/min. turn. Uses 26-volt, 400-cycle, 3-phase a-c.

(193*)

Dimensions: Per spec. AND 10401

General: A 4-minute turn indicator with both single and double pointer width deflection for 180°/min. turn. Uses 24 volt d-c or 28 volt d-c power.

(194*)



● GYRO HORIZON

Manufacturer: Sperry Gyroscope Co.

Model: H-5

Weight: 3 lbs.

Dimensions: 3½" dia. x 7 3/16" long

General: An electrically driven gyro horizon with 360° roll and pitch range using 115-volt, 400-cycle, 3-phase a-c.

(195*)



● DIRECTIONAL GYRO

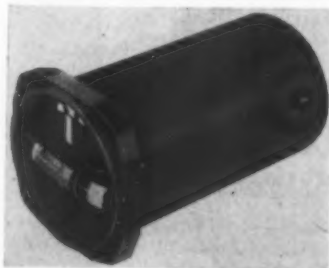
Manufacturer: Eclipse-Pioneer Div., Bendix Aviation Corp.

Model: 16800

Weight: 7 lbs.

General: A gyro-controlled instrument operating on 115-volt, 3-phase, 400-cycle current. The warning signals on dial face show "power off" and "caged" conditions.

(197*)



● TURN & BANK INDICATOR

Manufacturer: Schvien Engineering Co.

Model: B4B (AF Type C-6)

Weight: 2½ lbs.



**Looking
For
More
Infor-
mation?**

See pages 5 & 6.

Leadership demands constant achievement



WANTED!

300,000
SKYWATCHERS

AIR ATTACK!... This alarm could be sounded in the U. S.—tonight, tomorrow, any time! If it is, then time will be priceless—every moment vitally important.

Fortunately we do have a warning system—a combination of radar stations and volunteer civilian skywatchers, the Ground Observer Corps. And the Air Force has protective squadrons of Lockheed Starfire interceptors ready to answer any alarm—climb quickly to the attack—locate and knock out invading bombers in any weather, day or night.

But unfortunately our warning system is not complete. We need 300,000 more volunteer observers! **WE MUST HAVE MORE GROUND OBSERVER CORPS MEMBERS TO ASSURE 24-HOUR WATCH OF ALL VULNERABLE U. S. AREAS.**

Radar cannot do the whole job, because ground stations can't always spot planes flying under 5,000 feet. The only immediate answer is sheer man power—patriotic men and women who will donate just a few hours each week to the security of the U.S. and themselves.

Too few people realize the need or urgency. *You* can help—by joining the Ground Observer Corps and by spreading the word. To volunteer, simply call your nearest Civilian Defense Office. Or send a postcard to Ground Observer Corps, United States Air Force, Washington 25, D. C.

Lockheed

Aircraft Corporation

Burbank, California, and Marietta, Georgia

*Look to Lockheed
for Leadership*

ENEMY AIRCRAFT COULD PENETRATE U. S. DEFENSES

Early this summer top U.S. Air Force officials met with Civil Defense directors from 46 states and four territories, and reviewed in confidential detail the current efforts to defend America from surprise enemy attack.

"Despite a \$300,000,000 radar fence around the nation's perimeter, gaps exist through which enemy aircraft could penetrate our defenses undetected," the meeting was told.

That's why America needs a total of 500,000 civilian skywatchers as members of the Ground Observer Corps. Nearly 200,000 have already volunteered.

"The only practical means of filling the gaps in our defenses is through a 24-hour operation by civilian volunteers," the meeting was told.

Why isn't America's radar network sufficient?

Defense gaps exist because of radar's line of sight principle, and radar's failure to penetrate opaque masses. Every mountain, every hill casts a shadow behind which enemy aircraft could sneak undetected. Even in perfectly flat country the curvature of the earth shortens the effective range. Equally alarming, radar is susceptible to jamming.

These gaps cannot be filled by Air Force personnel due to the staggering expense. That's why civilians are needed in 27 perimeter states to man Ground Observer Corps stations 24 hours a day. Here is a critical, patriotic job that requires just a few hours a week from each volunteer.

Aircraft too are an important part of our national warning system and of course are the backbone of defense against attack. Three advanced Lockheed planes play a vital role:

The WV-2 *Super Constellation* Early Warning Aircraft, developed for the Navy and the Air Force to extend radar's range in a whole new concept of national defense.

The P2V *Neptune* Navy Patrol Bomber, charged by the Navy with anti-submarine patrol and protection of U. S. coastal waters.

And the F-94C *Starfire*, the nearly automatic all-weather interceptor, which does the final job of climbing to the attack at terrific speed, locating the invaders, and shooting them down with more than human accuracy.

When the U. S. has all necessary planes and personnel—civilian and military—it will be difficult for enemy aircraft to penetrate U.S. defenses.



● ACCELEROMETER

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 3416

Weight: 10 oz.

Range: Three models: 3417 ranging from -5 to +12 g's; 3416 ranging from 0 to +10 g's; 3419 ranging from -5 to +10 g's.

General: Models 3417 and 3419 use three pointers, while model 3416 uses a single pointer. Models 3416 and 3419 have 2" dial faces and 3417 a 2 3/4" dial. (198*)



● GYROSYN COMPASS

Manufacturer: Sperry Gyroscope Corp.

Model: C-2A

Weight: 14 1/2 lbs.

Dimensions: Gyro: 6" dia. x 8" long

General: Periodic course resetting is not necessary since the heading does not drift. The compass, which operates electrically, indicates magnetic north without northerly turning error. (199*)



● MAGNETIC COMPASS

Manufacturer: Eclipse-Pioneer, Div. of Bendix Aviation Corp.

Model: 1841

Weight: 1 lb., 9 oz.

General: Direct-reading, rim-lighted, panel-mounted aircraft compass graduated in 5° increments for installation in shock mounted panels. (200*)



Best Approach Condition



Too Fast Condition



Too Slow Condition

● LIFT CONTROL INDICATOR

Manufacturer: Safe Flight Instrument Corp.

Model: 502

Weight: 1.5 lbs.

Dimensions: 3 1/8" diameter x 3 1/2" long

General: Two signal arms, black against a white background, are used to warn the pilot when his approach speed is too fast, too slow, or at the optimum. (201*)



● AIRSPEED INDICATOR

Manufacturer: Eclipse-Pioneer Div., Bendix Aviation Corp.

Model: 1426

Weight: 11.2 ounces

General: Operated in conjunction with a pilot-static tube, the model 1426 provides a differential pressure reading which is calibrated in miles per hour, kilometers per hour or knots. (202*)

* For more information see pages 5 and 6.

People

ADMINISTRATIVE

Harold Graham, Jr., who had been with Pan American World Airways for 14 years, has been elected vice president in charge of the cruise division of **Resort Airlines**. For the past two years he had served as assistant to the president and general manager of Panair do Brasil.

Dwain E. Fritz has been named engineering director and assistant to the president of **Jack & Heintz, Inc.** **Joseph E. Mulheim** was named chief project engineer and acting chief engineer, while **Ralph J. Eschborn** was appointed executive engineering manager.

Frank Rowell, Jr., has been elected to the presidency of **Guardian Electric Manufacturing Co.** of Chicago. Rowell will succeed his father, the late **F. F. Rowell, Sr.**

Dudley E. Browne, comptroller of the **Lockheed Aircraft Corporation**, Burbank, has been elected a regional vice president of the **Controllers Institute**.

Barry B. Willis, formerly controller of **Grand Central Aircraft Co.** has been elected a vice president.

David A. Thomas, named executive vice president and general manager of **Automatic Steel Products**, Canton, Ohio, by the firm's board of directors.

A. E. Moore appointed vice president and director of research and development of **R. M. Hollingshead Corp.** Prior to his new post, Moore was director of the **New Products** division for the corporation.

John C. McAbee, formerly manager of machine accounting for **United Air Lines**, has been made assistant to the vice president-finance and property. McAbee succeeds **Rexford E. Bruno** who was recently elected company comptroller.

OPERATIONS-MAINTENANCE

Captain Ralph F. Bower has been appointed chief pilot for **Mohawk Airlines**. He succeeds **Captain Robert H. Hancock**, who resigned to return to the line as a flying captain.

Oliver Whitney, formerly assistant station manager for **Pan American World Airways** at **Idlewild**, transferred to **Keflavik, Iceland**, as station manager.

Jerry Theban has been transferred to **Tulsa** as supervisor-maintenance planning for **American Airlines**. He formerly was routing chief-air control in **New York**.

Dr. Urner Liddel, recently chief of physics branch of the **U. S. Atomic Energy Commission**, has joined **Bendix Aviation Corporation** to direct product development in applied physics and atomic energy.

Ralph Weller has been named manager of **Trans-Canada Air Lines'** new station in **Dusseldorf, Germany**. **TCA** is due to start operation into **Germany** November 1.



Weller

Joseph N. Pease, **San Francisco**, is the new station operations manager of the **Fiji Islands** for **Pan American World Airways**.

Robert C. Roberts, formerly manager of **Mohawk Airlines'** station in **Syracuse, N. Y.**, has been transferred to **Albany** in the same capacity.

MILITARY

Brig. Gen. Floyd B. Wood has been appointed Deputy for Development of the **USAF's Air Research and Development Command**. He succeeds **Brig. Gen. John W. Sessums**, who was recently named **Commanding General** of the **Thirteenth Air Force** in the **Philippines**.

Rear Adm. Thomas S. Combs, USN, Chief of the **Bureau of Aeronautics**, **Dept. of the Navy**, has been sworn in as a member of the **National Advisory Committee for Aeronautics**. He replaces on the Committee **Rear Adm. Theodore C. Lonnquest, USN**, former Deputy and Assistant Chief of the **Bureau of Aeronautics**.

TRAFFIC & SALES

Charles M. Doolittle has been appointed district sales manager in **Dallas** for **Braniff Airways**, replacing **Ray Stamps**, who is on an extended leave of absence.



Doolittle

Frank Martin and **Jack Zook** have been named as assistant sales managers of **Cessna Aircraft Co.** of **Wichita, Kansas**. **Martin** will handle sales, and **Zook**, the administration of the division.

Paul Parsons, Jr., formerly with **Braniff Airways** in **San Antonio**, is now district sales manager for the airline in **Memphis**.



The following airline employees recently completed 20 years or more of service in the industry with the same company:

- **M. A. Crowder**, **Capital Airlines**. Manager, flight dispatch, **Washington, D. C.** 23 years.
- **George Mehalov**, **Trans World Airlines**. Mechanic, **Chicago**. 20 years.
- **H. C. Curfman**, **Trans World Airlines**. Engineer, maintenance, **Los Angeles**. 20 years.
- **J. J. Scholze**, **Capital Airlines**. Manager, ground operations, **Washington D. C.** 20 years.
- **Fred C. Klein**, **Capital Airlines**. Manager, reservations and ticket offices, **Washington, D. C.** 20 years.
- **Raymond G. Lochiel**, **Capital Airlines**. Vice president and treasurer, **Washington, D. C.** 20 years.
- **Buenaventura Ortega**, **Pan American World Airways**. Mechanics helper, **Tegucigalpa, Honduras**. 20 years.
- **Captain Walter J. Jones**, **Pan American World Airways**. Pilot, **Rio de Janeiro, Brazil**. 20 years.

New!

THOMPSON SLOTTED RETREAD



Alternating slots... a new design principle developed by Thompson Aircraft Tire Corporation over a year ago... retains the side-slip resistance of straight rib design yet lengthens wear by providing more even distribution of tire load. Slots are tapered in depth — both at sides and ends — to reduce the hazard of picking up bolts, rocks or other extruding objects.

Superior performance has been established in tests by 30 airlines on over 2,000 Slotted Retreads. No other tread design provides such longer wear plus so very efficiency comparable to the new Thompson Slotted Retread.

Thompson retreads are sold... over 100,000 have been used on airplanes throughout the world!



THOMPSON Aircraft Tire CORPORATION

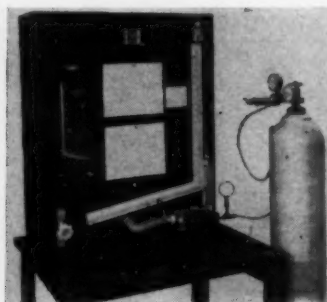
EASTERN PLANT: International Airport - Miami 32, Fla. • WESTERN PLANT: 12th & Minnesota Dr., San Francisco 7, Calif.
Phone BR 7551 Miami 7-7224



SHOP EQUIPMENT



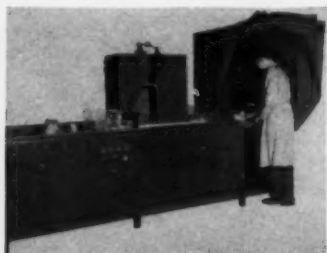
AEROL ENGINE STAND model AC-110 will handle Wright R-2600 & R-3350 Pratt and Whitney R-2800 engines. Manufactured by the Cleveland Pneumatic Tool Co. It is one of several stands including the model AC-24 and AC-5, the latter suited for radial engines up to 2,000 cu. in. displacement. (203*)



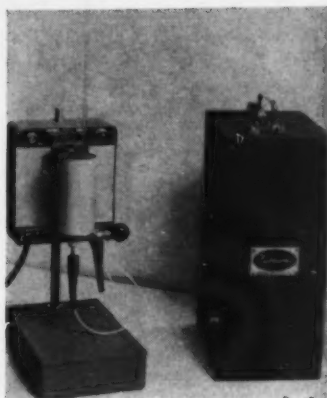
● TEST STAND

Manufacturer: Fluid Power Inc.
Model: 3102

General: Typical of a series of fluid power test stands designed to test all types of oxygen regulators and associated equipment. (204*)



OVERHAUL inspection of non-magnetic parts is facilitated by this Zyglo ZA-28 unit, one of the smaller size Zyglo units built by the Magnaflux Corp. (205*)



● TEMPERATURE TESTER

Manufacturer: Fenwal Inc.

Model: 8001-5

Dimensions: 20" x 8" x 8"

General: Designed to test Fenwal heat control switches and fire detectors, the model 8001-5 has a top limit of 1000° F. while the 8001 covers temperatures up to 600° F. (206*)



● BORESCOPE

Manufacturer: Testa Manufacturing Co.

Model: B-18

Dimensions: 1/2" dia. x 18" long

Weight: 5 1/2 lbs.

General: An optical inspection instrument used to inspect inside walls of engine cylinders, crankcases, and similar surfaces. Internal walls appear magnified in the illuminated optical field of the instrument. Magnification up to 6.25 x depending on target distance. (207*)

* For more information see pages 5 and 6.



CANTILEVER engine stand shown here designed by Whiting Corporation handles all sizes of reciprocating engines currently in production. Replaces three different sizes plus miscellaneous related equipment formerly produced by Whiting. (208*)



● HYDRAULISCOPE

Manufacturer: Aeroquip Corp.

Model: 10,000 A

Weight: Approx. 50 lbs.

Dimensions: 8 3/4" x 14 1/4" x 18 3/4"

General: High speed electronic analyzer which translates the output of a pressure pickup tapped into the hydraulic system to vertical deflections of a cathode-ray oscilloscope. Records high speed pressure phenomena of aircraft hydraulic systems such as those resulting from operation of individual components. (209*)



COMPARATIVE CHECKING of cylinder compression is made possible by the Acromatic compression testers made by Gabb Special Products. These pencil-type testers are installed in sets so that two turns of the crankshaft checks all cylinders. (210*)

Test Stands

Unit	Manufacturer	Model	General Purpose	Dimensions	Remarks
Hydraulic test stand	Schaffer Air Industries, Inc.	49-1	Test hydraulic accessories	48" x 84" x 72"	10 gpm @ 3,000 psi plus booster system
Vacuum pump test stand	"	45-1	Test vacuum pumps	48" x 72" x 72"	All types
Slaved gyro compass tester	"	41-1	Test compass and components	10" x 12" x 6"	For Sperry J-1 and J-2 systems
Circuit breaker tester	"	42-1	Test circuit breakers	12" x 18" x 14"	300 amps tester capacity
Fire detector system tester	"	39-1	Test system and components	10" x 12" x 6"	For testing Edison system
Alternator test stand	"	39-1	Test alternator and controls	24" x 24" x 72"	Capacity 15 kw
Fuel pump test stand	"	46-1	Test engine driven pumps	48" x 72" x 72"	Capacity 6,600 pph @ 100 psi
Propeller control tester	"	47-1	Test pitch change rates	10" x 12" x 6"	For Curtiss-Wright propellers
Control cable load test unit	Durham Aircraft Service, Inc.	DAS-1001	Proof load testing cables after fabrication to assemblies	Actuator end unit 84" x 40" x 39"; Deadman end unit 69" x 40" x 35"	The DAS-1001 is a complete self-contained unit designed for fast and accurate proof load testing of aircraft control cable assemblies after fabrication in compliance with USAF specification MIL-C-5688A. Unit is equipped with all quick change adaptors for AN standard cable fittings. Adaptors for special fittings can be supplied.



● WING JACK

Manufacturer: Smith-Nelson Corp.

Model: Sancor 2560-31

Weight: 1,150 lbs.

Capacity: 25 tons

General: Hydraulic type jack with fixed tripod height of 60", 44" hydraulic ram lift plus 18" screw extension for maximum extended height of 122". One of a series of Sancor jacks covering all types and sizes of aircraft. (211*)

* For more information see pages 5 and 6.



● BOOSTER PUMP

Manufacturer: The Cleveland Pneumatic Tool Co.

Model: W8346

Dimensions: 6" W x 43" L x 7 3/4" H

Weight: 31 lbs.

General: A booster pump for inflating shock struts and filling accumulators, the Aerol model W8346 has .65 cu. ft./min. output and operates on a 15:1 pressure ratio. (212*)



● TEST STAND

Manufacturer: Strata Instrument Co.

Model: 700

Weight: 90 lbs.

Dimensions: 21" x 19" x 13 1/2"

General: Used for testing and calibrating tachometers, generators, and synchrosopes. Reference tachometer and stroboscope makes possible calibration within 3 rpm at intervals of 100 rpm. Range is 200-4,500 rpm. (213*)



NON-DESTRUCTIVE testing of metals, ceramics, plastics, etc., is speeded with Spotcheck, a dye penetrant type inspection material manufactured by Magnaflux Corp. Available in 12 oz. dispenser spray cans. (214*)



CYLINDER HOLDING fixture manufactured by C. A. Fulmer Co. and used to hold aircraft cylinders for honing and other processes. One of a series of cylinder servicing machines including honing machines, ring lapping machines, and honing tools made by Fulmer. (215*)



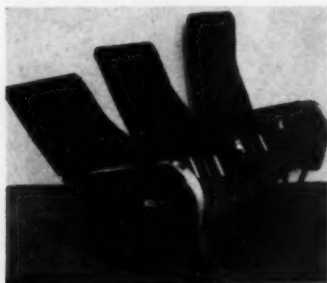
FURNISHINGS



● PASSENGER SEAT

Manufacturer: Transport Equipment Co.
Model: Typical

General: One of 20 models of passenger seats manufactured to desired dimensions and rated up to nine g's for aft-facing installations. Available in one-, two-, or three-passenger layouts. (216*)



● PASSENGER SEAT, HIGH-DENSITY

Manufacturer: The Aerotherm Corp.
Model: 443-3R
Weight: 84.5 lbs. complete
Dimensions: 59.5" x 44.50" x 26.70" straight, 39.20" reclined.

General: Designed for 10-g loading forward and six-g backward, sideways, and down. Back reclines 45° optional stop and 65° maximum. Adaptable to track mounting as well as conventional floor fastening. (217*)



● PASSENGER SEAT

Manufacturer: Hardman Tool & Engineering Co.

Model: 3026

Weight: 72 lbs.

Dimensions: 47" x 26" x 41"

General: A nine-g, two-passenger seat adaptable for berth installations in transport aircraft. (218*)



● PASSENGER SEAT, HIGH-DENSITY

Manufacturer: Burns Aero Seat Co.

Model: IM-3 (See chart for other models.)

Weight: 75 lbs.

Dimensions: 27.25" x 59.5" x 45"

General: A six-g, three-passenger, high-density seat for ultra-close spacing. Of all-steel construction. (219*)



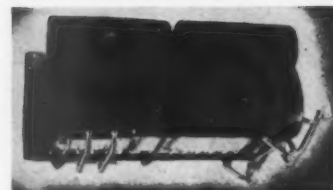
● SEAT, FOLDING

Manufacturer: Weber Aircraft Corp.
Model: 72912

Weight: 63 lbs. approx.

Dimensions: Not available.

General: A double-folding personnel seat of aluminum and steel tube frame construction. Reclines from 12° upright to 36° full recline. Includes airfoam rubber cushions. (220*)



● PASSENGER SEAT, FOLDING

Manufacturer: Aeromsmith, Inc.

Model: N-24 (See chart for other models.)

Weight: 41 lbs.

Dimensions: Not available.

General: A nine-g, two-passenger folding seat of X4130 tubular steel construction adaptable to fixed or folding use in high-density installations. (221*)



● PASSENGER SEAT, FOLDING

Manufacturer: Hardman Tool & Engineering Co.

Model: 300 5-D (See chart for other models.)

Weight: 50 lbs.

Dimensions: 39" x 26" x 41"

General: A six-g, two-passenger, folding seat of 61ST tubular aluminum construction for transport aircraft use. (222*)



● PILOT SEAT

Manufacturer: Aircraft Mechanics, Inc.

Model: Long range

Weight: 50 lbs.

Dimensions: USAF Spec. 25285

General: A 20-g pilot seat similar to AMI models installed in the C-121, C-123, and T-36A aircraft. (223*)



● PILOT SEAT

Manufacturer: The Aerotherm Corp.

Model: 357

Weight: 47.5 lbs.

Dimensions: 47¼" high, 20" wide x 26¼" long, vertical, 39¼" long, reclining. (224*)



● NAVIGATOR CHAIR

Manufacturer: Hardman Tool & Engineering Co.

Model: 604

Weight: 19 lbs.

Dimensions: 15" x 20" x 37" (225*)



REF Skygalley



Weber Buffet

● SKYGALLEY

Manufacturer: REF Manufacturing Corp.

Model: DC-6B

Weight: 275 lbs.

Dimensions: 24" x 48" x 79"

General: Designed for 60-passenger service; aluminum and stainless steel construction for 12-g deceleration. (226*)

● SKYGALLEY

Manufacturer: REF Manufacturing Corp.

Model: DC-7

Weight: 340 lbs.

Dimensions: 24" x 48" x 79"

General: A galley for serving 60 passengers, as ordered by American Airlines for its Douglas DC-7's. (227*)

* For more information see pages 5 and 6.

● BUFFET

Manufacturer: Weber Aircraft Corp.

Model: DC-6 aft buffet for Braniff Airways. (228*)

● OVEN

Manufacturer: REF Manufacturing Corp

Model: Whirlwind Oven

Weight: 54 lbs.

Dimensions: 18¼" x 17 9/16" x 16 15/16"

General: A 12-plate electric oven operating on 24- or 208-volt current; 250-watt maximum. Maintains 395° F. (229*)

Passenger Service Equipment

Unit Name	Mfg.	Dimensions	Rating	Capacity	Material
Ovens	Molex Prods Co.	14" x 8¾" x 14"	200W	12" x 8" x 12"	Fiberglass plastic
Beverage dispenser	"	6" x 8" x 10"	100W	2 gal.	"
Serving trays	"	Custom	.....	.....	"
Liquid cooler	"	6" x 8" x 10"		2 gal.	"
Frozen food container	Schaffer Air Industries	16" x 23" x 15"			Stainless steel
Refrigerator	Molex Prods. Co.	Custom manufacture for airlines or USAF-Navy			
Commode can	Schaffer Air Industries	12"D. x 14" High			Stainless steel
Lavatory tanks	"	Custom	.....	Custom	"
Droppable liquid container	General Tire & Rubber Co.			5 gal.	Rubber & fabric
Serving trays	"	To specifications			Polyester

Passenger Seats

Unit Name	Mfg.	Type	Dimensions	Rating	Capacity	Wt.	Material	Remarks
Passenger seat	Aero Smith, Inc.	W24	Low density	9g	2	44 lbs.	Structure: X4130 tubing	Fixed or folding
"	"	W14	Low density	9g	1	32 lbs.	"	"
"	"	N34	High density	9g	3	55 lbs.	"	"
"	"	N14	High density	9g	1	30 lbs.	"	"
3015 D	Hardman Tool & Engineering Co.	Pass.	47" x 26" x 41"	9g	2	68 lbs.	Tubular aluminum	Commercial aircraft pass. chair
3004	"	"	25" x 26" x 41"	6g	1	46 lbs.	"	Executive aircraft chair
3025 D	"	"	40" x 26" x 41"	6g	2	52 lbs.	"	Commercial aircraft pass. chair
3025 T	"	"	59" x 26" x 41"	6g	3	72 lbs.	"	"
4006 DB	"	"	40" x 26" x 41"	6g	2	52 lbs.	"	"
3001 M	"	"	29" x 28" x 33"	6g	1	49 lbs.	"	Executive
High-density seat	Burns Aero Seat	1D2H	39.25" x 37" x 24.12"	6g	2	46 lbs.	All-steel construction	Removable arm rests, deluxe trim
"	"	1D3H	58.25" x 37" x 24.12"	6g	3	69 lbs.	"	Air foam cushioning
"	"	1M2	41" x 45" x 27.25"	6g	2	50 lbs.	"	15" shin clearance
Folding & stowing seat	"	1550	39.5" x 40" x 24"	6g	2	40 lbs.	"	Can be entirely removed from airplane if desired
"	"	1560	57.3" x 40" x 24"	6g	3	60 lbs.	"	"
Deluxe divan	"	1840	44" x 31" x 27.5"	6g	2	56 lbs.	"	Built for airline use
Leg rest seat	"	2D1LR	24.5" x 41" x 61.25"	9g	1	46 lbs.	"	Self-contained telescoping leg rest
Executive seat	"	2D1	24" x 41.25" x 27.25"	9g	1	40 lbs.	"	Swivel base optional
Pass. seat	The Aero-therm Corp.	441-2	48" x 44.50" x 26.70"	10g	2	62.19 lbs.		
"	"	290-D	47 $\frac{1}{2}$ " x 40 $\frac{1}{4}$ " x 29 $\frac{1}{2}$ "		2	50.45 lbs.		
"	"	305B-1	25 $\frac{1}{4}$ " x 40 $\frac{3}{4}$ " x 29 $\frac{1}{2}$ "		1	28 lbs.		
Position locks	Burns Aero Seat	For all types of seats		Withstands 3,500 lb. loads		Variable	"	Newest technical devlpmt.

Crew Seats

Unit Name	Mfg.	Type	Dimensions	Rating	Capacity	Wt.	Material	Remarks
Crew seat 900	Hardman Tool & Engineering Co.	Crew	19" x 32" x 25"	9g	1	26 lbs.	All steel construction	Military seat
901	"	"	20" x 18" x 18"	6g	1	15 lbs.	"	"
902	"	"	23" x 32" x 25"	6g	1	28 lbs.	Aluminum & Chrome Moly	"
903	"	"	22" x 32" x 24"	20g	1	32 lbs.	"	"
904	"	"	15" x 20" x 37"	4g	1	19 lbs.	Aluminum	"
909	"	"	23" x 32" x 25"	20g	1	30 lbs.	Aluminum & Chrome Moly	"
611	"	"	19" x 24" x 45"	6g	1	32 lbs.	"	"
613	"	"	19" x 20" x 50"	20g	1	30 lbs.	"	"
Crew seat	Aerosmith, Inc.	C10		20g	1	7 $\frac{1}{2}$ lbs.	"	Fixed
Crew seat	"	C11		20g	1	22 lbs.	"	Folding
Crew seat	"	C12		20g	1	25 lbs.	"	Folding
Crew seat	"	C14		C.A.A. TSO-C25	1	21 lbs.	"	"

Crew seat	Stanley Aviation Corp.	Vertical adjustment	40g				Upward ejection
Crew seat	"	Diagonal adjustment	40g				
Crew seat	"	Vertical adjustment	40g				Downward ejection
Crew seat	"	Diagonal adjustment	40g				
Seat	TECO	Crew	Up to 20g	1	Varies	Typical	5 different models
Pilot & co-pilot seat	Burns Aero Seat	100-LP	23" x 43.75" x 24.8"	16g	41 lbs.	"	Complete swivel, vertical
Flight engineer seat	"	1DISR	24" x 48.75" x 27"	6g	44½ lbs.	"	Fort/aft adjustng. optional head or arm rests
Crew seat	"	1540	19.12" x 36.75" x 22.75"	16g	31 lbs.	"	

Seat Belts, Etc.

Seat belt	The Russell Mfg. Co.	RM-3	2" x 52"	1500 lbs.	1	Approx. 15.40 oz.	
Seat belt	"	RM-4	2" x 52"	1500 lbs.	1	Approx. 15.58 oz.	
Lap belt	SAC	Automatic release	Standard	40g	1		For use with ejection seats
M-5100 seat belt	Air Assoc. Inc.	C.A.A. lap strap TSO-C22A	2-inch web	1500 lbs. tension 2850 body block	1	High quality cotton web	Conventional lap belt
M-4450 Hi-G shoulder harness	"	CAA TSO-C22A	2-inch web	4,275 lbs. forward	1	High quality cotton web	Diagonal shoulder strap with lap belt; CAA-approved
M-4138 Shoulder harness	"	Conventional	2-inch web	3,000 lbs. web	1	High quality cotton web	Attaches to lap belt
Strap extensions	"		2-inch web	3,000 lbs. web		High quality cotton web	Cargo & misc. applications



● PRESSURE REGULATING VALVE

Manufacturer: The Aerotec Corp.

Model: RV9000

Weight: 1.1 lbs.

General: Used in fuel tank pressurizing systems, the RV9000 series valves regulate compressed air discharge at predetermined values, inlet pressures 12 to 20 psi, outlet pressures 10 ± 5 . A balanced type valve with close regulation and no leakage in the closed position. (230*)

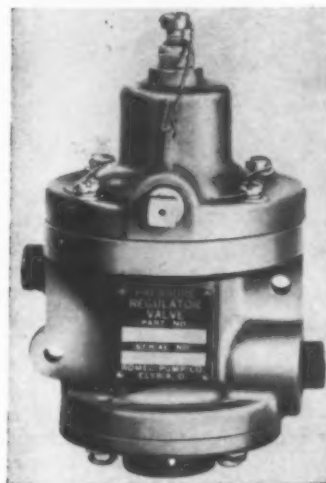


● VACUUM REGULATOR

Manufacturer: Schvien Engineering Co.

Models: 2550, 2650 & 2750

General: Designed to meet AN 5828-2, -3 and -4 specifications, the model 2550 regulator is set at 2" Hg. at 0.5 cu. ft./min., the model 2650 at 4" Hg. at 6.0 cu. ft./min., and the model 2750 at 4.6" Hg. at 10 cu. ft./min. (231*)



● WATER PRESSURE REGULATOR

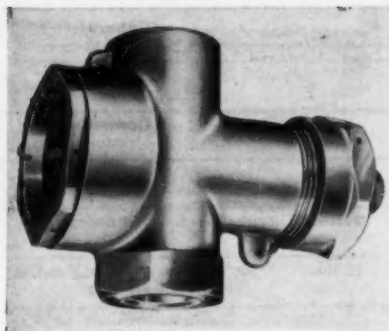
Manufacturer: Romec Div., Lear, Inc.

Model: RB-7550

Weight: 0.98 lb.

Dimensions: 2¾" x 5 3/16"

General: For use in engine water injection systems, the Romec RB7550 is rated at 15 to 23 psi or 23 to 80 gph. (232*)



● VACUUM REGULATOR VALVE

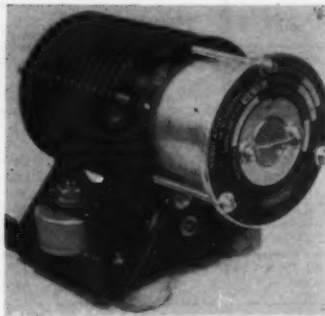
Manufacturer: Romec Div., Lear, Inc.

Model: RA-2090

Weight: 0.436 lbs.

Dimensions: 2" x 2"

General: A poppet type vacuum regulator covering the range from 4.5" to 6" Hg. (233*)



● VOLTAGE REGULATOR

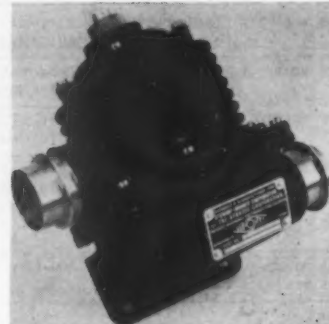
Manufacturer: Jack & Heintz, Inc.

Model: GR 28

Weight: 3 lbs.

Dimensions: 4" x 5 15/32" x 4 3/8"

General: A carbon pile regulator with a regulating range of 26.5 to 29.5 volts. (234*)



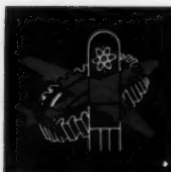
● HIGH TEMPERATURE REGULATING VALVE

Manufacturer: The Aerotec Corp.

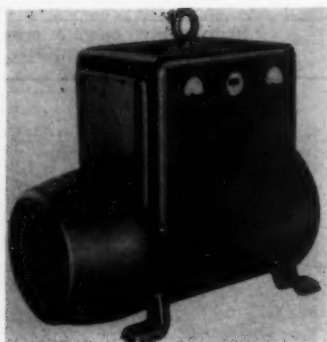
Model: RV21001

Weight: 6 lbs.

General: For use with hot combustion gases up to 500° F., the RV21000 series regulators are used to provide accurate control of gases in such installations as fuel tank purging systems. (235*)



AIRPORT EQUIPMENT



● GROUND POWER SUPPLY

Manufacturer: Motor Generator Corp.

Model: 672E8AH, 673E8AH, 675E8AH

Capacity: 5 hp, 10 hp & 20 hp providing 3, 5 & 10 kw respectively.

General: Provides automatically controlled voltage and frequency regulated 400 cycle power supply suitable for use in testing aircraft instrument and radio systems. Useable with 220/440 volt a-c power supply. (236*)

● GROUND POWER SUPPLY

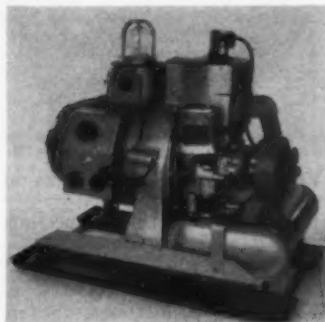
Manufacturer: Inet, Inc.

Model: 1497-A

Capacity: Selective 750 or 1,500 amperes output provided by two rectifiers individually limited to 1,000 amps.



General: A mobile ground auxiliary power unit providing dual output from two regulated selenium rectifiers operating on an input current of 440 volts 3 phase 60 cycle. Designed for Boeing B-47 operation. (237*)



● POWER SUPPLY

Manufacturer: Homelite Corp.

Model: 24A115

Weight: 135 lbs.

Capacity: 2,500 watts

Dimensions: 20" x 18 1/2" x 25"

General: A gasoline powered a-c generator, completely self-excited providing 110 volt 60 cycle a-c current. (238*)



● GROUND POWER SUPPLY

Manufacturer: Motor Generator Corp.

Model: 666

Capacity: 600 amps at 28.5 or 750 amps for 3 min. intermittent duty. Draw power pull of 2,000 lbs.

General: A mobile ground auxiliary power unit and towing tractor powered by a 6 cylinder 69 hp Chrysler Model IND-8 engine. Dimensions are 40" wide x 110" long x 53" high. (239*)

* For more information see pages 5 and 6.



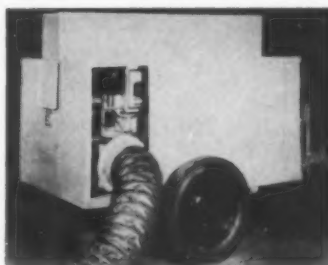
● GROUND HEATER

Manufacturer: Herman Nelson

Model: Deluxe #1

Dimensions: 56¼" x 31¾" x 50"

General: Available in models from 280,000-450,000 BTU output, with air flow ranging from 2,000-2,300 cu. ft./min. Provisions for two flexible duct connections. (240*)



● GROUND AIR CONDITIONER

Manufacturer: U. S. Thermo Control Co.

Model: AF-75

Dimensions: 107" long x 67¼" wide x 68" high

Capacity: 7 tons, 84,000 btu/hr.

General: A general purpose ground air-conditioning unit, the Thermo-King model AF-75 is available with either gasoline engine or electric motor drive. Designed for heating or cooling of aircraft cabins, work areas, mobile shops or temporary quarters. (241*)



● GROUND HEATER

Manufacturer: Herman Nelson

Model: BT-400

Dimensions: 50"L x 24"W x 23"H

General: The model BT-400 is a combustion heater with a maximum output of 400,000 BTU at -65° and is used for ground heating of aircraft and engines. A flexible duct can be attached. (242*)



HEAVY DUTY, dual rear wheel tractor shown here is one of a series produced by the Mercury Manufacturing Company. The model A-452-52 is rated at 4,000-5,000 pound draw bar pull at 2 mph speeds. Weight approximately 6,000 lbs. (243*)



STREAMLINED passenger loading ramp shown here is one of a series produced by Tobey Manufacturing Corp. Available in 12- and 13-foot lengths, these units are 6 feet wide and of adjustable height. Weighs 1,500 lbs. (244*)



ALUMINUM baggage carts of several types similar to that shown above are produced by Tobey Manufacturing Corp. Capacities range up to 3,000 lbs. with basic dimensions 48"W x 96"L x variable height. Weight 450 lbs. (245*)

* For more information see pages 5 and 6.



ALL-PURPOSE weighing scales with capacities ranging from 1,125 to 6,500 lbs. are typified by this Toledo Scale Co. model 1500. Unit features full floating platform, self gauging pivots and automatic dash pots. (246*)



TURNTABLES for convenience in spotting aircraft in the terminal area and for compass rose functions is provided with the Wakefield turntable. The type B-2 shown here is 6½ feet in diameter and has a 50-ton capacity. Model B-1 of 37" diameter is rated at 25-ton capacity. (247*)



● FUELING NOZZLE

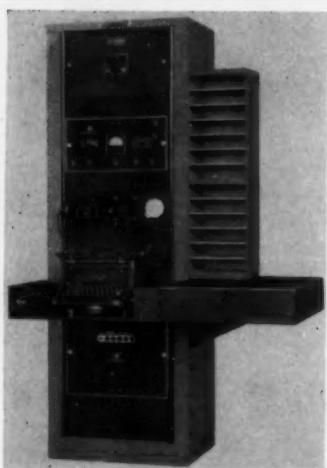
Manufacturer: Parker Appliance Co.

Model: Underwing Fueling

Dimensions: 11⅝" x 15"

General: A 600 gpm aircraft fueling nozzle provided with a safety shut-off feature for under-wing fueling operations. (248*)

Airport Communications



● PACKAGED VHF STATION

Manufacturer: Wilcox Electric Co., Inc.
Model: 428A, B, C, D

Dimensions: 72" high radio relay rack

General: A complete communications station including 50-watt transmitter, power supply and receiver. Includes type 305A receiver, type 406A VHF transmitter, 407A power supply and type 614A VHF antenna. Equipment includes a telephone-type control panel, loudspeaker, typewriter well, message rack, and desk-type front. (249*)



● PORTABLE CONTROL TOWER

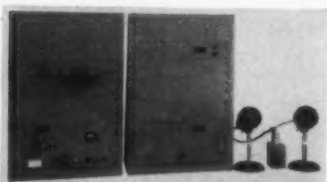
Manufacturer: Lear, Inc.

Model: LTR-6G

Dimensions: 9" x 13" x 10 1/4"

Weight: 25 lbs.

General: A single-channel transmitter normally set at 122.8 mc and a VHF receiver ranging from 107-127 mc with special calibration at the UNICOM frequency. Designed for use by fixed base operators. (250*)



● AIRPORT DIRECTION FINDER

Manufacturer: Federal Telecommunication Laboratories, Inc.

Model: FTL-14L

Weight: 182 lbs.

General: The FTL-14L is a 10-channel, crystal-controlled, VHF airport direction finder operating in the 108-156 mc range. Provides pilot with instantaneous direction to control tower information. (251*)



● MULTI FREQUENCY TRANSMITTER

Manufacturer: Wilcox Electric Co., Inc.
Model: 99A

Dimensions: 32" x 26" x 72"

General: Simultaneous transmission on several frequencies is possible with the Wilcox Model 99A Airport Multi-Frequency Transmitter. Unit provides transmission on 125-525 kc, 2-18 mc and 100-160 mc. Power output is 400 watts and maximum keying speed is 150 words/min. Weight, 1,400 lbs. (253*)



● TERMINAL OMNI-TVOR

Manufacturer: Maryland Electronic Mfg. Corp.

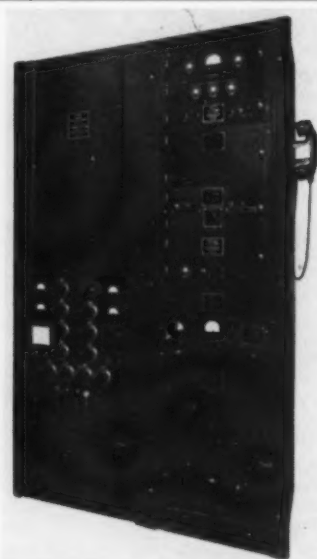
Model: MDR

Weight: 900 lbs.

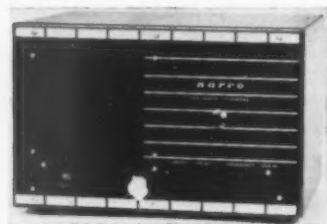
Dimensions: 76" x 48" x 20"

General: A letdown facility for airports not equipped with VOR, transmitting a signal of 108-118 mc for reception by all standard airborne omni equipment. Housing shown is part of the

* For more information see pages 5 and 6.



packaged unit, a shelter 8' square with a 15" dia. counterpoise. (252*)



● AIRPORT RADIO TELEPHONE

Manufacturer: National Aeronautical Corp.

Model: VGTR-1

Dimensions: 7 1/8" x 12" x 7 1/2"

General: A crystal-controlled, single-channel transmitter and receiver normally set at 122.8 mc but available with two channels within the range from 100-150 mc. (254*)

Fabrics: Million Dollar Airline Market

New planes and new materials are pushing sales up

in a field where standardization is a trend.

OVER ONE MILLION dollars will be spent this year in the purchase of fabrics by the domestic and international airlines of the U. S., an expenditure which for the most part will be distributed among less than two dozen major fabric manufacturers and which is centered in the upkeep of initially expensive and competitively luxurious airplane interiors.

That the market will pass the one million dollar figure this year is a certainty. According to a recent survey conducted by AMERICAN AVIATION, the industry expenditure for these materials in 1951 approached \$940,000. The introduction of many new airline transports during 1951 and the early part of 1952 coupled with increasing material costs ranging up to 20% will add considerably more than the \$60,000 that the total fell short of the one million mark last year.

But the market is an ever changing one, the survey reveals. The airlines are continually in search of new materials, fabrics which will offer them longer wear and reduced maintenance costs with the least sacrifice in appearance. This search has not gone unrewarded and these trends have become evident:

- **Floor coverings** of the vinyl broadloom or vinyl coated Fiberglas type are taking the place of wool carpeting. In plush interiors where carpeting is still used the trend is from wool to nylon materials.
- **Nylon faced materials** are replacing wool/mohair or 100% wool seat upholstery and in some instances lightweight plastic seat covering is being used.
- **Vinyl coated fabrics** are being used instead of soft wool materials for cabin side wall and ceiling decor.

The change to plastic-coated floor covering has made itself most evident in the local service airlines and the coach type services of the larger carriers. Supporting the change, according to the opinions received, are its lower initial cost, the ease of maintenance it offers, and the improved appearance it provides in floor areas subjected to high traffic, such as would be experienced in coach type operations.

Major suppliers of this type material mentioned in the survey are the Duracote Corporation and the B. F. Goodrich Company. Durug, a product of the former, is described as a vinyl coated Fiberglas carpeting weighing 25 ounces per yard and used with a neoprene impregnated hairfelt underlay, weighing the same as the Durug. Avtrim, a B. F. Goodrich product, was reportedly widely used as carpeting, side wall and ceiling upholstery.

Despite the trend toward plastic floor covering, carpeting of the wool-mohair, 100% wool, and nylon cut-pile, types remains the highest individual cost item exceeding \$300,000 annually. It represents twice the cost of any other single

replacing wool and the same manufacturers predominating in the field of supply.

In new aircraft as well as in the refurbishment of those aircraft received in the period following the war, the trend in cabin sidewall and ceiling covering has been from soft wool materials to vinyl coated fabrics. With longer life and simpler maintenance the reason for the change, a variety of fabrics are in use.

Major manufacturers and their products represented in this field are B. F. Goodrich (Avtrim), Firestone (Velon Flex), Du Pont (Fabrilit), and Duracote (Dura-trim). In bulkhead materials, some airlines have adopted U. S. Plywood's Flexwood, said to attain the appearance of natural wood paneling and create a feeling of permanence and solidness.

Dollars & Cents

SAMPLING twelve airlines representing the large and small operators, AMERICAN AVIATION's survey provided these annual expenditures for the year 1951, shown with an estimate of the total industry costs according to the airline use of the material involved.

Material Use	Annual Expenditure Airline Surveyed	Annual Expenditure Airline Industry *
Curtains	\$99,500	\$146,300
Carpeting	222,400	326,500
Upholstery	111,200	168,200
Cabin lining	63,800	93,800
Headrest	51,300	75,400
Leather	20,100	29,600
Felt	14,300	21,000
Misc. fabrics	38,700	56,900
Misc. floor covering	14,900	21,900
Totals	\$636,200	\$939,600

* Estimate based on percentage of seat miles flown by airlines surveyed to those flown by total airline industry.

item used. Principal manufacturers, according to the survey are Collins & Aikman, Goodall Fabrics, Inc., Bigelow-Sanford, Alexander Smith, and Floor Styles, Inc.

In upholstery the trend has been toward use of nylon faced material by reason of its better wearing qualities and low shrinkage characteristics, according to the airline reports. Here again Collins & Aikman and Goodall Fabrics, Inc., are major suppliers, with Bridgeport Fabrics rounding out the list. Similar trends are appearing in the purchase of curtain materials, with nylon

One other trend is apparent from the reports received, that of a standardization of materials used between different types of aircraft. The procurement and maintenance difficulties long associated with the large variety of materials used by an airline on its different types of aircraft are diminishing as this trend gains headway.

Although the costs run high the future looks bright in the market of airline fabrics, a market that will continue to produce materials of greater durability, of improved appearance, and with an emphasis on easier maintenance.

Fabric Use Data

	American	Bonanza	Braniff	Braniff (Mid-Continent)	Capital	Colonial
Carpenting & floor covering	Collins & Aikman	Duracote Durug V218 glued hair carpet	Collins & Aikman	Collins & Aikman C118 Duracote Durug V218	Duracote Durug Duracote fibreglas Collins & Aikman #117B (45 oz.)	Collins & Aikman Mohair Duracote Durug B. F. Goodrich Avtrim
Upholstery	Collins & Aikman	Collins & Aikman Blue Bedford cord	Bridgeport Fabrics	Collins & Aikman 4-864 Goodall 74476		Collins & Aikman Bedford Cord Blue-forest green U. S. Rubber Nauga hyde
Wall & ceiling lining	Dupont Vinyl trim B. F. Goodrich Avtrim	Firestone Velon Flex LU65J1	Collins & Aikman gabardine Dupont Fabrilite		B. F. Goodrich vinyl sateen backed cloth (2.1 oz.); B. F. Goodrich vinyl Plytex backed cloth (1 oz)	Masland Co. Duran
Leather					Caas A. Toebe Leather Co.	Good McCree Leather Co.
Curtains	Collins & Aikman			Collins & Aikman 6-169	Goodall Fabrics SD-2866	Collins & Aikman Bedford cord gabardine
Headrests	Bearse Mfg. Co.	Plastic woven fibre				
General use			Flightex fabrics	B. F. Goodrich Avtrim	Goodall Fabrics Beaumont cloth	US Rubber V Board Consolidated Paper Co. Consoweld

	Frontier	Pan American	Piedmont	Southern	United	Wisconsin Central
Carpenting & floor covering	Collins & Aikman Grey	Collins & Aikman No. 117 B. F. Goodrich vinyl broadloom sponge backed RON 18 Bigelow Sanford	Duracote Durug	Bigelow Sanford Crede lakeweave	Floor Styles, Inc.	Duracote Durug
Upholstery	Goodall Fabrics brown	Collins & Aikman Nylplaid	Chatham Mfg. Co.	Georgia Coated Fabrics Weynolite	Collins & Aikman Goodall cord	Goodall Bedford Cord
Wall & ceiling lining	Payne & Co. brown	B. F. Goodrich Avtrim 18 oz. pin-seal grain; B. F. Goodrich Avtrim 9 oz. Skilvergrain	Dupont Fabrilite	Georgia Coated Fabrics Weynolite	Collins & Aikman Goodall gabardine B. F. Goodrich Avtrim	
Leather	Bridgeport Fabrics—tan	Armrests-Blanchard Bros. & Lane 25206		Pollock Leather Co. blue top grain Wilensky chrome calf	Blanchard Bros. & Lane	
Curtains		Collins & Aikman Viscose/wool/mohair				
Headrests		Nylon taffeta—Bearse Mfg. Co.				
General use	Seaman Sky Felt Hendrie & Bolthoff Leatherette	Flightex fabrics Alexander Lamport Bros. muslin; Schumacker & Co. Skytrall fabric	Dupont Fabrilite	Western grey felt	Flightex Fabrics Dupont Vinyl fabric Bridgeport Fabrics barkweave	

THE BULLETIN BOARD

Undisplayed Advertising: \$1.00 per line, minimum charge \$4.00. Cash with order. Estimate 30 capital letters and spaces per line; 40 small lower-case letters and spaces per line. Add two lines if Box Number is included in lieu of advertiser's name and address.

Displayed Advertising: \$10.00 per inch for less than 15 inches in one issue or in any 12-month period. For more than 15 inches, \$3.50 per inch; more than 30 inches, \$3.00; more than 60 inches, \$2.50; more than 90 inches, \$2.00; more than 120 inches, \$1.50. Space units up to full pages accepted in this section for classified-type advertising.

Forms close 20 days preceding publication date. Address all correspondence to Classified Advertising Department, AMERICAN AVIATION PUBLICATIONS, 1025 Vermont Ave., N. W., Washington 5, D. C.

FOR SALE

HILLER HELICOPTER—Model 360
Mfd. April, 1950—Total Time 650 Hours
Equipped with Improved Agricultural Spray System. Now in overhaul
EAST COAST AVIATION CORPORATION
Lexington 73, Massachusetts

A&E mechanic wanted to work into helicopter operation. Steady year around job, ideal working conditions, excellent opportunity to make money for capable, dependable man. Send record of experience and references to Box 784, AMERICAN AVIATION Magazine, 1025 Vermont Ave., N. W., Washington 5, D. C.

HAMILTON STANDARD

PROPELLERS-GOVERNORS-PARTS
LARGE INVENTORY
Advise Your Requirements
EDRAND AVIATION COMPANY
6111-12th Ave. So., Seattle, Wn.
Lander 7871

FOR COMPLETE MARKET REPORT of available multi-engine aircraft including Beech, Convair, Curtiss, Douglas, Grumman and Lockheed manufacture, write or call
WILLIAM C. WOLD ASSOCIATES
516 Fifth Avenue, New York 18, N. Y.
Telephone: MUrray 7-2050

DOUGLAS PARTS

DC3 — DC4

Fuselages—Nose Sections—Landing Gear—Main Gear—Wheels—Doors—Dem. Power Plant Units—Wings—Rudders—Ailerons—Flaps and other items as well as all component airframe parts.

Transport Aircraft—Engines—
Airline Equipment

IRLINE EQUIPMENT CORP.

Newark Airport, Newark, N. J.
MARKET 2-0963-4

LOOKING FOR BUSINESS

Lots of it in the upper
Midwest covered by

WISCONSIN CENTRAL AIRLINES

This dependable carrier serves
28 cities and uses engines
overhauled by

GOPHER AVIATION

Incorporated

Rochester, Minnesota

AIRPLANE ENGINE HOISTS

Model A-2A. Capacity 3000 Lbs.
Portable. Suitable for other uses.

Send for Booklet

The Vimalert Company, Ltd.

807 Garfield Avenue

Jersey City 5, New Jersey

LOCKHEED LODESTAR

Now in major overhaul. Can be finished to your specifications. One of the last built.

R-1820 205A Engines

ENGINEERING AND MANUFACTURING CORP.

P. O. Box 479

Galveston, Texas

ONE STOP EXECUTIVE AIRCRAFT SERVICE

Major Rebuild
Interiors

Authentic Integral Fuel Tank Sealing
Radio Installations

Relicense

One of the largest stocks of new Lodestar parts in the country.
We can handle your work.

ENGINEERING AND MANUFACTURING CORPORATION

P. O. Box 479

Galveston, Texas

**Make
This
Space
Work
For
YOU**

Get top dollar results
with the
**American Aviation
Bulletin Board**

ADVERTISER'S INDEX

Ace Products Company	52	General Electric	11, 62, 63
Aeronautical Representatives	30	B. F. Goodrich Company	12
Aerotherm Corporation	59	Greer Hydraulics, Incorporated	51
Airborne Accessories Corporation	64	Hydro-Aire, Incorporated	Third Cover
Aircraft Radio Corporation	30	Jack & Heintz, Incorporated	35
Airwork Corporation	33	Lear Incorporated	Front Cover
Frank Ambrose Aviation Company, Inc.	91	Hotel Lexington	103
A M C Supply Company	103	Lockheed Aircraft Corporation	106, 107
American Airlines, Inc.	66	Maryland Electronic Manufacturing	99
B G Corporation	Second Cover	Motor Generator Corporation	31
Bendix Aviation Corporation		National Airlines, Incorporated	60
Bendix Products Division	45	Republic Aviation Corporation	68
Bendix Radio Communications Division ..	70, 71	Simmonds Aeroaccessories, Inc.	49
Bendix Scintilla Division	39	Sperry Gyroscope	75
Boots Aircraft Nut Corporation	57	Swedlow Plastics Company	3
Breeze Corporation	95	Surface Combustion Corporation	
Canadair Limited	23	Janitrol Division	76
Champion Spark Plug Company	25	Texas Company, The	Back Cover
Chance Vought Aircraft Division		Texas Metal & Manufacturing Company	80
United Aircraft Corporation	8	Thompson Aircraft Tire Corporation	109
Cleveland Pneumatic Tool Company	47	Transport Equipment Company	24
Consolidated Vultee Aircraft Corporation	4	Trans World Airlines, Inc.	60
Continental Motors Corporation	79	Tubing Appliance Company	78
de Havilland Aircraft of Canada Ltd.	50	United Air Lines	92
Esso Export Corporation	27	Universal Metal Products Company	56
Fairchild Engine & Airplane Corporation		Vickers-Armstrongs Limited	21
Fairchild Stratos Division	29	Vickers, Incorporated	53
Flightex Fabrics, Inc.	50	Westinghouse Electric Corporation	72, 73
		Wilcox Electric Company	37
		Franklin C. Wolfe Company	102

News At Deadline



COMET III model shows Pan American markings. Deliveries are scheduled for 1956.

PAA Orders de Havilland Comets

Pan American World Airways has ordered three Comet 3 jetliners for delivery in 1956, and has a two-year option for seven more of the British de Havilland aircraft for 1957 delivery.

Commenting on this first jetliner order by a U. S. operator, Juan T. Trippe, PAA president, said that negotiations were also proceeding with American manufacturers for jet transport requirements. The company has no present plan for placing additional jet orders in the British market, he added.

The option, however, would permit acquisition of a fleet able to maintain the position of American flag air transport on principal trade routes abroad if suitable American-manufactured jets

are not available by 1957. The Comet 3 is described as "the first jet transport able to operate efficiently over the principal routes of the Pan American system." Routes to be flown with the Comet were not revealed by PAA. The company will get three of the first six Comet 3's off the assembly line, it was learned.

New information on the plane were disclosed by PAA in its announcement: payload will be 17,500 lbs. and fuel capacity 9,700 U. S. gallons in wing tanks and in two nacelle-type external tanks protruding from the wing's leading edge about 15 feet from the wingtips. Range is 2,700 miles with full payload, a 50-mph headwind and "adequate" reserves.

Nyrop Resigns as CAB Chairman

Donald W. Nyrop has resigned as chairman of the Civil Aeronautics Board, effective October 31. President Truman accepted the resignation "with deep personal regret."

Nyrop had headed the Board since May 18, 1951, and was generally considered to have been the ablest chairman in the agency's 14-year history. Vice Chairman Oswald Ryan will take

over the chairmanship Nov. 1, pending appointment of a new chairman.

Nyrop had told friends he planned to submit his resignation late this year, regardless of which party won the election, since he felt that all persons holding presidential-appointed positions should make their resignations available to an incoming President. He had asked President Truman to be relieved

of the job in July, and again in August, but it wasn't until late September that Truman gave his consent.

It is not believed that any one factor was responsible for the resignation. Nyrop was drafted for the job. He wanted to serve about a year, then return to private industry. His relations with the President were of the very best; he was not obligated to anyone in industry or in politics.

Nyrop has no plans other than to take a rest. During his chairmanship he refused to discuss future job commitments with anyone.

Harris Named President of NWA; Culbert Resigns

Harold R. Harris, vice president-Atlantic Division of Pan American World Airways, will take over as president of Northwest Airlines on Jan. 1, 1953, and Croil Hunter, present president, will become chairman of the board.

Hunter said that Harris' appointment was being made to strengthen NWA's organization "at a time when expanding business and ambitious plans for the future impose increased responsibilities on its top executives."

Harris was vice president and operations manager of Pan American-Grace Airways from 1929 to 1942. After wartime service with Air Transport Command as a brigadier general, he joined American Overseas Airlines as vice president and general manager, and upon purchase of AOA by PAA, he became vice president of that company's Atlantic Division.

In another management change, Amos Culbert resigned as NWA's vice president-sales, and Malcolm Mackay, executive vice president and assistant general manager, was given authority over the traffic and sales department. Culbert's resignation came suddenly and is understood to have initiated with him. He has not announced future plans. NWA revenues showed consistent increases under his supervision during the past two and one-half years. He had been an officer of Chicago and Southern and American Airlines before joining NWA in 1950.

James Mariner, general sales manager since July, 1951, has been promoted to the newly-created post of assistant vice president-sales. He joined NWA in 1947 after service with TWA and the old Dollar Steamship Line.

ATA Issues Basic Spec for U.S. Jet Transport

A new jet transport specification has been issued by the Air Transport Association, which expresses the belief that one basic jetliner can be designed to meet the major requirements of both transcontinental and international operators.

Despite the belief that this can be accomplished, ATA adds that, as an alternative "consideration should be given to providing such features as alternate wing panels, increased structural strength, additional fuel capacity, wing tip tanks, etc., in order to build one basic type airplane to fulfill both markets."

Requirements of the ATA spec are:

Passenger capacity: 70-80 in four-abreast seating. Fuselage diameter of 128 inches to permit five abreast seating.

Speed: Not less than 550 mph maximum recommended cruising speed, higher if practical without excessive penalty.

Range: 2,000 statute miles domestic, 3,200 miles international.

Airport requirements: At 30 degrees Fahrenheit, landing runway requirements of 5,500 ft. or less with only normal deceleration devices as built into the plane—no arresting cord or parachute requirement, even for emergencies. Take-off runway requirement, domestic, based on 550 mph cruising for 2,000 miles plus landing at maximum landing weight. International, same criteria, with 3,200 miles range and 7,500-ft. maximum runway requirement. Aircraft to be certificated for 40 mph crosswind component.

Operating costs: Ton-mile cost no higher than today's transports (DC-6, Constellation) at moderate altitudes—25,000 to 30,000 ft. ATA feels altitude limitation may be required in early operations and plane should meet this requirement economically.

Pressurization: Maximum differential pressure of 10 lbs. per sq. in., capable of being pressurized while on the ground. Maximum cabin rate of climb of 250 ft. per min.

Fuel: None stored in fuselage—underwing single source fuel and defueling provided for.

Douglas Strike Settled

Wage dispute between Douglas Aircraft's El Segundo plant and 13,000 members of AFL-Machinists was settled Oct. 17. Agreement provides a 5¢ per hour boost (Douglas' offer before the two-week strike began Sept. 15), retroactive to Aug. 25, plus several fringe

benefits. Federal mediators were still working to settle the dispute between Lockheed-Burbank and 25,000 other Machinists.

Land Sees 45 Million Passengers by 1960

U. S. domestic and international scheduled airlines will carry more than 45,000,000 passengers in 1960, an 84% increase over last year, Adm. E. S. Land, president of the Air Transport Association, has predicted.

About 41,250,000 of these will travel on domestic carriers, and 4,174,000 on international lines, he said in an article written for *Planes*, official publication of Aircraft Industries Association. The 1951 totals were 22,636,000 and 2,033,000, respectively. The 1952 estimates are 26,190,000 and 2,333,000.

Domestic cargo ton-miles in 1960 will be 370,585,000, compared to an estimated 237,775,000 in 1952, Land said, adding that international cargo will be 108,000,000 ton-miles against 77,673,000 this year.

Land also foresaw the advent of jet transports in U. S. carrier's overseas operations by late 1957 or early 1958. By 1960, the airline's share of trans-Atlantic passenger traffic, making ever larger inroads into steamship travel, should rise to 70-80% of the total, he estimated.

New British Engine Will Power Comet 4

A new 11,000-lb. static thrust ducted-fan gas turbine, named the Conway, is now being test-run by Rolls-Royce Ltd., it has been learned.

The engine has been selected to power de Havilland's entry into the 200,000-lb. gross jetliner field (provisionally and unofficially known as the Comet 4. It is believed to be the powerplant combining the advantages of the turbo-prop and pure jet mentioned by Sir Miles Thomas, BOAC chairman, in his recent discussion of future trends in jet development.

Ireland Leaves DATA

Ray Ireland has resigned as Defense Air Transportation Administrator because of the "press of duties with United Air Lines." He is vice president-traffic administration of UAL. Robert Turner, vice president-sales of Northeast Airlines, who has been serving as a consultant to Ireland, is acting DATA Administrator.

ASTA Sees \$1 Billion in Foreign Travel in 1952

Expenditures of U. S. residents for travel abroad will go over the billion-dollar mark for the first time in history this year, according to estimates by the American Society of Travel Agents.

ASTA's annual convention in Miami this month was told that in 1952 Europe and the Mediterranean will earn \$261 million from tourism; Canada, \$262 million; Mexico, \$187 million; West Indies and Central America, \$87 million; South America, \$28 million, and other areas, \$15 million.

Transportation expenses from these totals, the report said, should yield \$164 million to foreign steamship lines and airlines, and \$90 million to U. S. air and sea carriers.

CAB Demands New Management for LCA

CAB has ordered Lake Central Airlines' management to arrange for an interim substitute management to handle the airline pending permanent divestiture of control by present owners. Present management, headed by president John V. Weesner, was given 30 days to set up the substitute arrangement which, CAB said, possibly could be a voting trust with a trustee directing.

CAB found the present management unable to meet tests of fitness, willingness and ability, although it ruled the airline services involved are needed in the public interest. The substitute management would run the airline until CAB approval of either the pending agreement under which Wisconsin Central Airlines would buy out present owners or "some comparable arrangement."

Meanwhile, a route sought by both Lake Central and Wisconsin Central was awarded to the latter by CAB until September 30, 1955. It involves service between Michigan's Upper and Lower Peninsulas.

GCAC Denies Rumors

Grand Central Aircraft Co. has "no intention of going out of business," C. C. Moseley, board chairman, said in answer to rumors that the company's Glendale, Calif., plant was about to "fold." Rumors apparently stemmed from newspaper stories that the GCAC property was to be acquired by the state for use as a state college. The deal was never consummated, but even if it had been it would not have interfered with company activities, since the tract is remote from GCAC shops, hangars, etc., Moseley said.

Engineered to
an entirely
new concept
of efficiency

Qualified to function under extreme HIGH-g conditions

By engineering to new basic principles, this Hydro-Aire Gate Valve offers many innovations and advantages. It is qualified to function under extreme "high-g" conditions. It is lighter, smaller, and less expensive. Rubber has been completely eliminated.

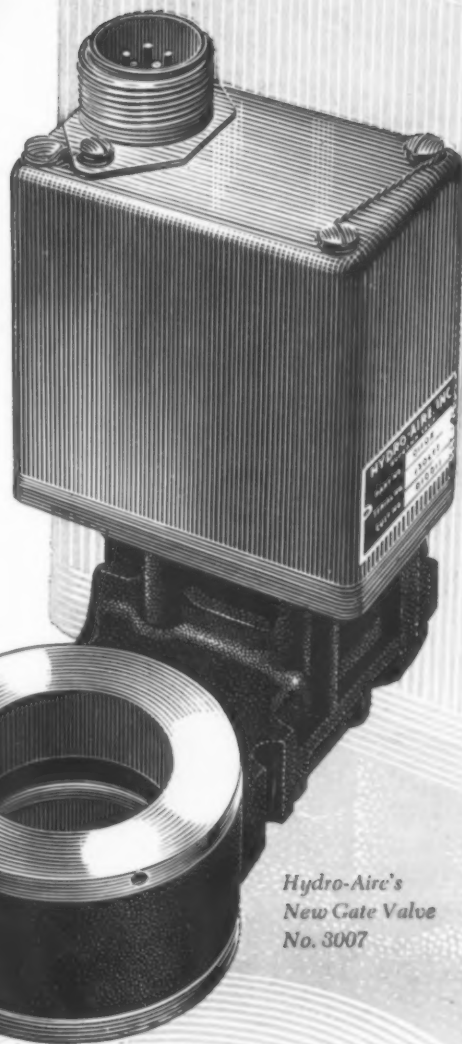
The introduction of an entirely new type clutch and manual override offers far more efficient and far safer operation.

Here is an engineering accomplishment, thoroughly tested, completely proved and in production, ready to deliver to you a new concept of Gate Valve efficiency and simplicity.

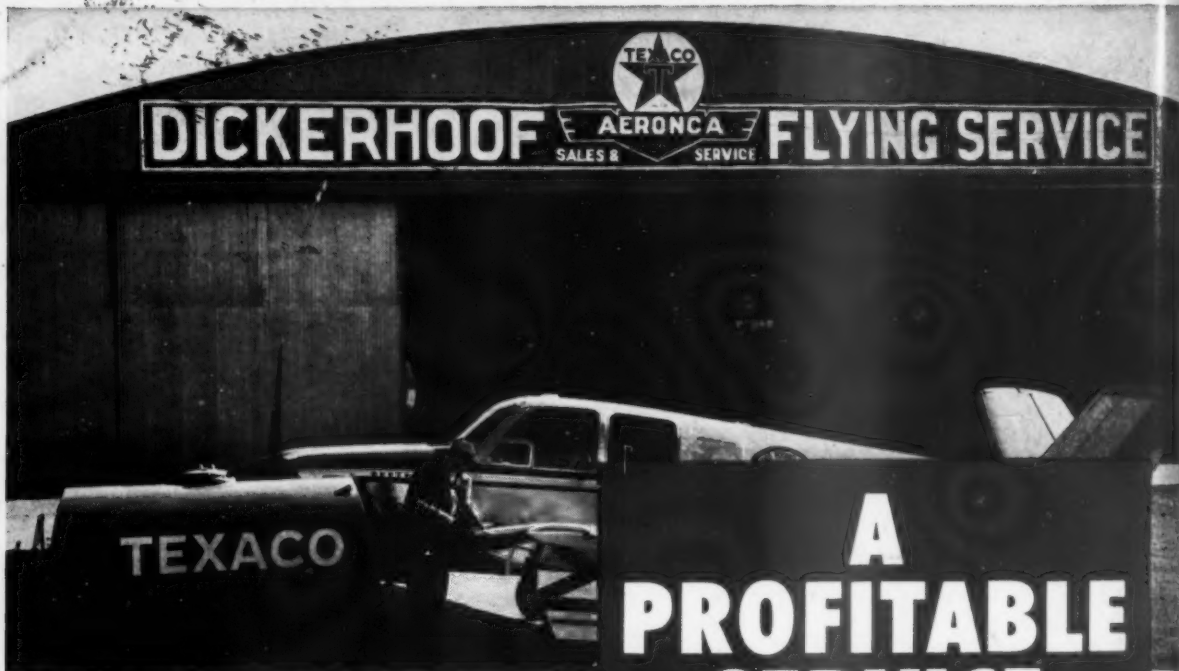
Sizes 1½", 2", 2½", 3". Manual override. Position indicator. Operates with all aircraft fuels, engine oil, hydraulic oil, alcohol, water, air, and gas. Manually operated version available.

HYDRO-AIRE
Inc.

BURBANK, CALIFORNIA
Subsidiary of Crane Co.



*Hydro-Aire's
New Gate Valve
No. 3007*



Dickerhoof facilities include: Cafe, CAA communication station, courtesy car, modern administration building, hard surfaced runway, ample hangar space, expert repair service — Texaco Aviation Lubricants and Fuels exclusively.

OURS was the only field where the line man bothered to clean the windshield without request." "I certainly appreciated . . . your letting me make use of your courtesy car." "I received the finest service . . ."

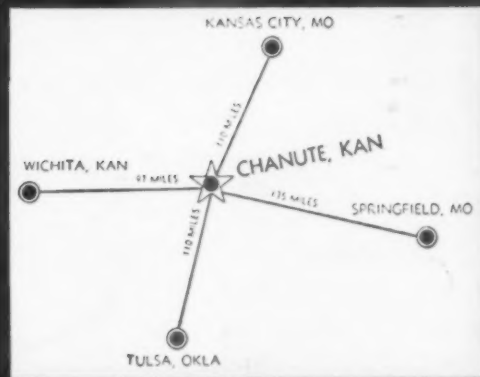
You couldn't ask for better evidence of "on the ball" service than those quotes from customers' letters to Dickerhoof Flying Service, Chanute, Kansas. And service is the reason why this hustling airport is doing such a great business.

For 23 years, Dickerhoof Flying Service has teamed its "blue chip" service with the "blue chip" quality of Texaco Aviation Products. Fred W. Montague, Jr., head of the Dickerhoof operation, tells why: "We feel it's part of our service to see that our customers get only the finest fuels and lubricants. We've always handled Texaco because Texaco has really helped our business to grow."

When you team your good service with Texaco, you've established a profitable partnership. Texaco is far and away the preferred name in aviation. For example —

For over 15 years, more revenue airline miles in the U. S. have been flown with Texaco Aircraft Engine Oil than with any other brand.

A PROFITABLE SERVICE TEAM FOR 23 YEARS



Let a Texaco Aviation Representative give you the full story. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO Lubricants and Fuels

FOR THE AVIATION INDUSTRY



TUNE IN: On television—the TEXACO STAR THEATER starring MILTON BERLE. See newspaper for time and station.